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TYPICAL COMMERCIAL ELECTROMAGNETIC DEFLECTION SYSTEMS: When we analyse the circuits of electromagnetically deflected television sets, which have appeared on the market to date, we find much greater diversity of design than in electrostatic systems. The chart of Figure 81 shows the result of such an analysis. The combinations selected by the design engineers for the horizontal and vertical systems respectively have been arranged in the order of the frequency of use in current production models. From this diversity of design, we can infer that the art is in a state of flux, and that as new models appear, many unusual circuit arrangements will be employed. The ultimate aim of the research and design departments is toward simplification and economy.

The combinations shown in the chart are each representative of receivers of several manufacturers. Example No. 1, for instance, has been employed with minor design differences by at least six companies. It will be instructive to examine the typical combinations and determine the operating principles of the various parts of the circuits. These will be covered in the order shown in the chart (Figure 81) and designated as "Example 1", "Example 2", etc.

ELECTROMAGNETIC SYSTEM - - EXAMPLE 1. The deflection system outlined, Example 1 in the chart of Figure 81, has been used in more models than any other to date. We have shown examples of its application in Figure 34 of page 29 and Figure 73 of page 63.

	HORIZONTAL SYSTEM	VERTICAL SYSTEM
1.	A. F. C. Sync Discriminator Reactance Tube Sine Wave Oscillator Pulse Forming Stage Output Amplifier Damping Tube	Blocking Oscillator Output Amplifier
2.	A. F. C. Sync Discriminator D. C. Amplifier Cathode-Coupled Multivibrator Output Amplifier Damping Tube	Assymetrical Multivibrator Output Amplifier
3.	Blocking Oscillator Output Amplifier Damping Tube	Blocking Oscillator Output Amplifier
4.	A. F. C. Sync Discriminator D. C. Amplifier Cathode-Coupled Multivibrator Output Amplifier Damping Tube	Blocking Oscillator Output Amplifier
5.	A. F. C. Sync Discriminator Reactance Tube Sine Wave Oscillator Pulse Forming Stage Current Oscillator Output Stage	Cathode-Coupled Multivibrator Output Amplifier
6.	A. F. C. Control Stage Blocking Oscillator Output Amplifier Damping Tube	Assymetrical Multivibrator Output Amplifier

Fig. 81. Chart of Electromagnetic Deflection Systems as Used in Present-day Receivers

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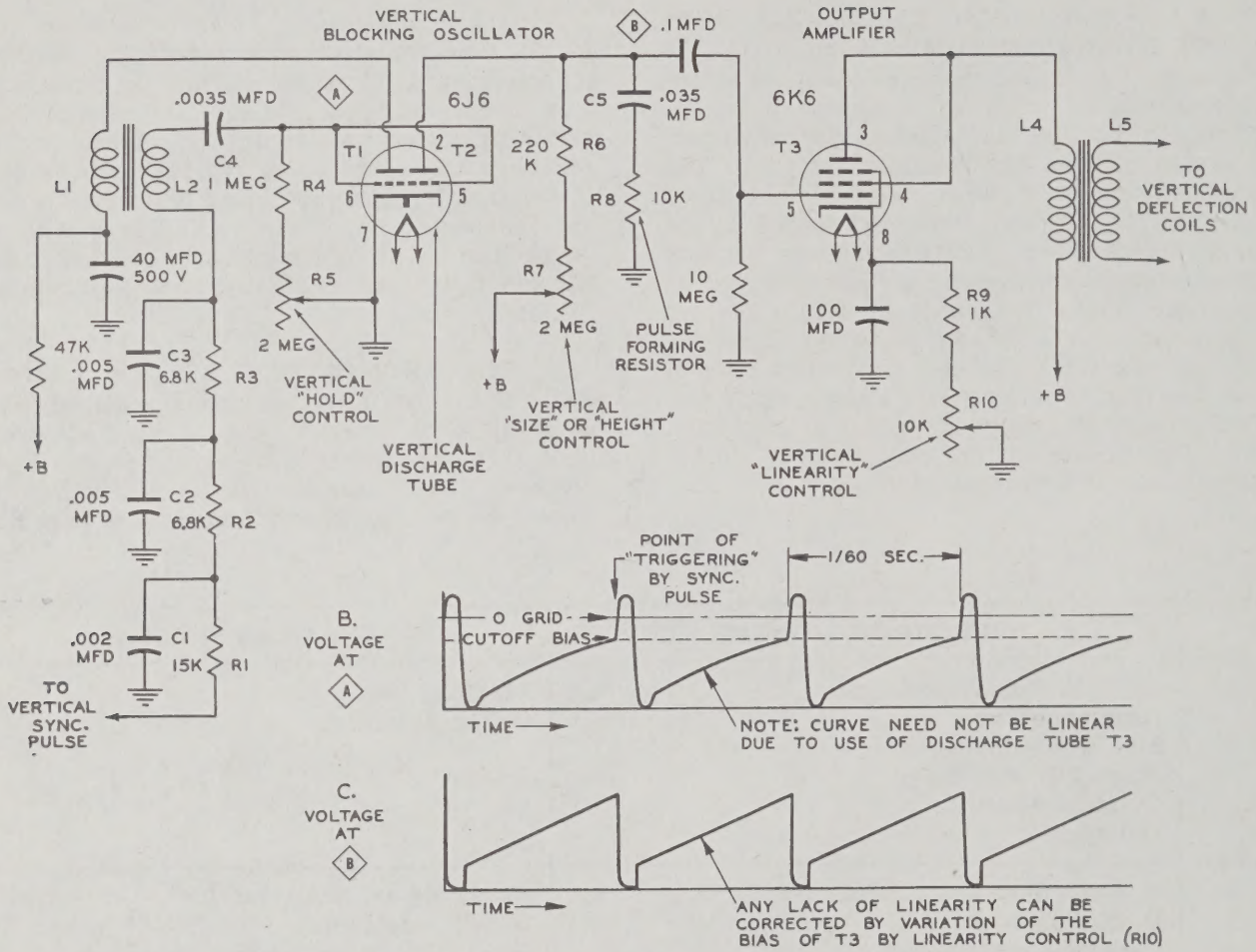


Fig. 82. Electromagnetic Deflection Systems - Example 1. Vertical Circuit

Let us examine the circuit of a different receiver than that studied previously.

Vertical Deflection System. Figure 82 shows the details of the vertical deflection system of this receiver. It combines a number of the circuit elements which we have previously discussed such as: the vertical pulse-integrating circuit, the blocking oscillator, the discharge tube, and the series C-R circuit which forms the combination sawtooth and pulse wave required for electromagnetic deflection.

The network of resistors and capacitors R1-C1, R2-C2, and R3-C3 comprises the "integrating" circuit which shapes the vertical sync signal and applies it in series with the grid circuit of the blocking oscillator tube (T1). The pulse arrives at the grid at the proper time to "trigger" the plate current pulse as described and illustrated on pages 54 and 55. This insures that retrace of the vertical scanning from bottom to top of the picture occurs at the correct instant as shown in Figure 66.

The action of the blocking oscillator circuit of tube T1 has been covered in pages 47 through 49. In the present circuit its application is conventional. The "free running" frequency is controlled by the time constant of capacitor C4 and its discharge resistors R4 and R5 in series. R5 is variable and acts as the "hold" control to adjust the oscillator frequency to "lock" with the repetition rate of the vertical sync pulses.

The second section of the dual triode acts as a discharge tube to "short" the network consisting of C5 and R8, which forms a voltage wave consisting of a linear sawtooth followed by a pulse as described on page 60.

The charging voltage, supplied to network C5-R8, is controlled by the series

combination R6 and R7 connected to the "B" supply. R7 is made adjustable to act as the "height" or "size" control.

Tube T3 is a triode-connected output amplifier and serves to increase the amplitude of the "sawtooth-pulse" to the proper level for action of the vertical deflection coils. The only feature of special interest in this part of the circuit, is the variable cathode bias resistor (R9 and R10 in series). Adjustment of the operating point on the grid voltage-plate current curve, by the setting of R10, serves to introduce the proper amount of distortion to correct any departure from linearity of the sawtooth scanning wave. This control is known as the vertical "linearity" control.

In practice, adjustment of R7 (vertical "height") and R10 (vertical "linearity") are somewhat interdependent. In this type of circuit, the vertical "size" or "height" control primarily affects the lower half of the picture, while the vertical "linearity" control has its major effect upon the upper half of the picture.

Figure 82B and 82C show the form of voltage waves appearing between ground and points (A) and (B) respectively.

Horizontal Deflection System. Figure 83 shows the horizontal deflection system of the receiver which has been selected as typical of Example 1 (Figure 81). It consists of a combination of circuit elements which have been treated separately in our discussion to this point, namely: the sine wave oscillator (controlled by the sync pulse through an A. F. C. system and "reactance" tube), pulse shaping circuits and tubes, followed by a horizontal output tube and a triode damping tube.

The sync pulses are separated from the signal and applied to the grid of a "sync amplifier" T1 through network C1-R1. The plate circuit of this tube supplies the vertical amplified pulses directly from the plate to the "integrating" network of Figure 82. The amplified horizontal pulses are taken from a tap on the voltage divider R3-R4, and applied through C2 to the A. F. C. sync discriminator or "phase detector." This circuit, employing a dual-diode (6AL5), will be recognized as the "Seeley-Foster" discriminator used for FM detection. Its use in this circuit is to compare the repetition rate of the sync pulses with the frequency of the horizontal oscillator, and to produce a DC output voltage for control of the reactance tube (T4). The reactance tube automatically adjusts the frequency of the horizontal oscillator and keeps it in step with horizontal scanning. The action of this circuit will be described in more detail later.

Tube T5 is employed as an electron-coupled oscillator. The screen is at ground potential, for the oscillator frequency (15,750 cycles), due to the bypass capacitor C7. Feedback, to sustain oscillation, is furnished by the

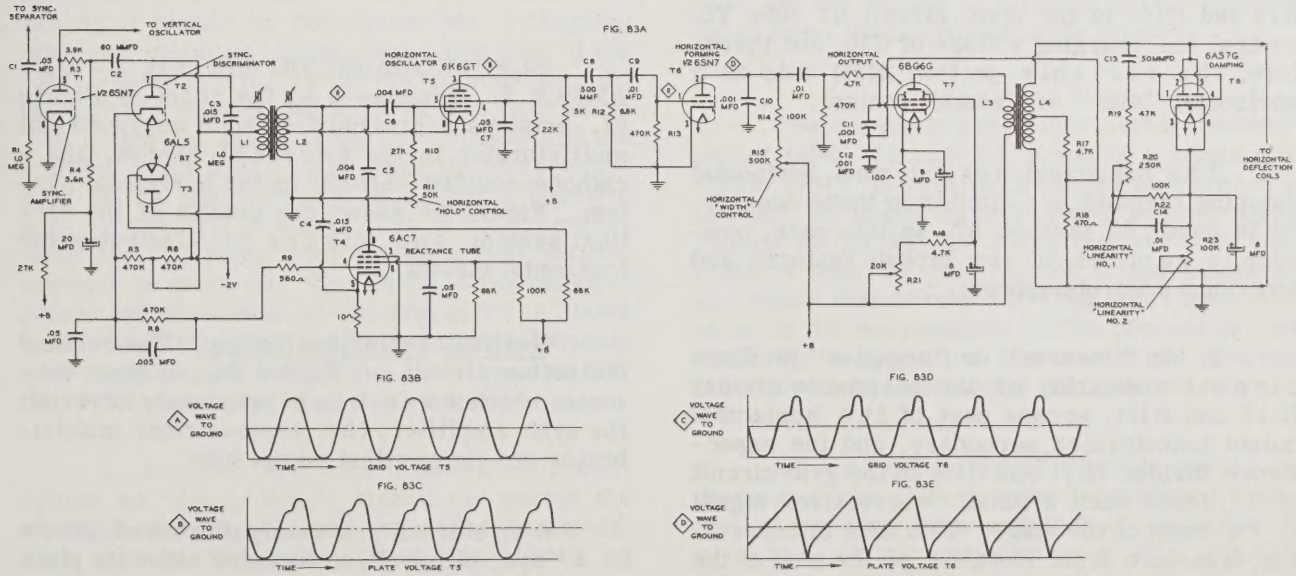


Fig. 83. Electromagnetic Deflection Systems - Example 1. Horizontal Circuit

"hot" cathode tap on the transformer secondary L2. In this circuit, there are two adjustable frequency controls: the iron core tuning "slugs" of transformer windings L1 and L2, and the grid resistor combination R10 and R11. The transformer adjustments are pre-set, or semi-fixed, to assure that the action of the horizontal "hold" control (R11) will cover the proper frequency range on either side of center of its rotation.

Figure 83B shows the sine wave voltage appearing across the oscillator grid circuit. This voltage is electron-coupled to the plate circuit of tube T5. In this circuit, the first shaping of the wave from its sine form to the required pulse occurs as shown in Figure 83C. This action takes place when the plate swing reaches the region of plate current cut-off during part of the cycle.

The coupling network C8-R12, C9-R13 acts as a "differentiating" circuit and further sharpens the wave shape as shown in Figure 83D.

The voltage wave, of Figure 83D, is impressed on the grid of the horizontal "forming" tube (T6). This tube acts in much the same manner as the discharge tube described on page 49. The positive voltage peaks on the grid cause plate conduction to discharge a sawtooth capacitor C10 in its plate circuit. This produces the wave form (Figure 83E) which is used to "trip" the horizontal output tube (T7). R14 and R15, in the plate circuit of tube T6, control the charging voltage of C10, and therefore, the variable portion (R15) acts as a horizontal "size" or "width" control.

The horizontal output and horizontal damping circuits are similar to those described in pages 62 through 67. In this case, however, a number of new circuit features and additional controls appear:

1. An "inverse" or "negative" feedback circuit consisting of the resistance divider (R17 and R18), across part of the horizontal output transformer secondary, and the capacitance divider (C11 and C12) in the grid circuit of T7, feeds back a small "corrective" signal to the input of the stage. This aids in correcting departure from linearity of the part of the sawtooth current wave contributed by tube T7.

The expedient of employing a small amount of negative feedback to improve linearity is used in other deflection circuits and the service technician should be able to recognize it. Often this feedback takes the form of coupling from the cathode circuit of the output tube to a capacitance divider in the input of the same tube.

2. The screen voltage of the horizontal output tube (T7) has been made variable by means of resistor R21. This control serves to adjust the amplitude of plate current contribution by tube T7, to the scanning wave. In this case, the control is a "semi-fixed" adjustment and has no descriptive name. It is an auxiliary "width" adjustment for the right hand half of the picture.

3. The damping tube circuit, shown in Figure 83A, is similar to that described on pages 66 and 67, with the addition of a second "linearity" control (R23). In this case, "linearity" control No. 1 (R20) is used as described on page 67 and its function is to adjust the center area of the picture. "Linearity" control No. 2 (R23) is used to expand the left hand side of the picture.

As in other deflection circuits discussed, these controls, "width" (R15), "linearity" No. 1 (R20), and "linearity" No. 2 (R23) are interdependent and the adjustment of any one may necessitate readjustment of the others.

ELECTROMAGNETIC SYSTEM - - EXAMPLE 2. Example 2 in the chart of Figure 81, employs a grounded cathode assymetrical multivibrator in the vertical circuit, and a cathode-coupled version in the horizontal system. Figure 84 shows the details of the vertical system, and Figure 85 illustrates the horizontal circuit.

Vertical Deflection System. The vertical deflection circuit of Figure 84, employs elements which have been previously covered: the sync amplifier, the assymetrical multivibrator and the vertical output tube.

A circuit not previously discussed, known as a "sync clipper", is included since its plate circuit components are an essential part of the deflection circuit under consideration. The

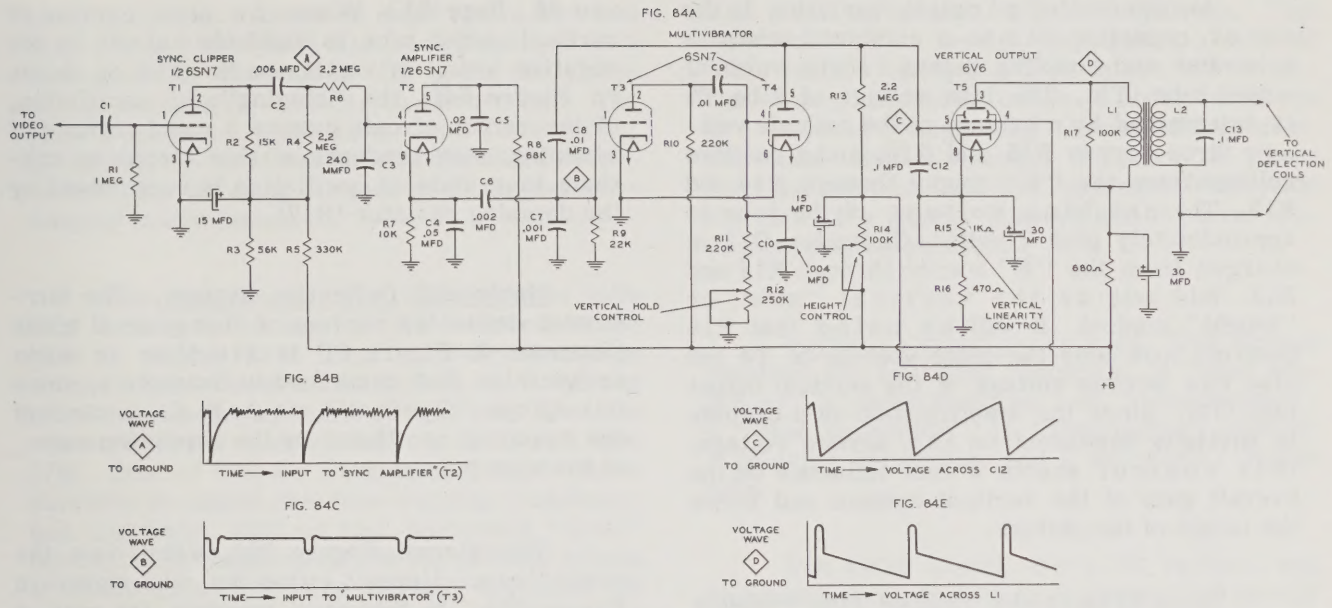


Fig. 84. Electromagnetic Deflection Systems - Example 2. Vertical Circuit

"sync clipper" operates at very low plate voltage, (approximately 15 volts in this circuit), and derives its bias by grid rectification of the video signal. Plate current conduction occurs on the peaks of the video signal only. These peaks actually are the sync pulses. Thus tube T1 "clips" the sync pulses and passes them on to the sync amplifier tube (T2). (See Figure 84B.)

Although we have labeled T2 as a sync amplifier (its common commercial name), in reality it should be considered as a coupling tube and isolation stage. Since the load of the tube, resistor R10, is in the cathode circuit, the voltage gain of the stage is less than unity. The output is taken from the cathode and the voltage pulse which this tube delivers to the grid of the multivibrator tube (T3) is negative with respect to ground. This is the requirement for "tripping" the sweep action, as described on page 55. The shape of the negative pulses which appear at the grid of T3 is shown in Figure 84C. The coupling network between the "sync clipper" (T1) and the "sync amplifier" (T2) has several unusual features:

1. Resistor R6 and capacitor C3 constitute an "integrating" circuit to accept the vertical sync signals and reject the horizontal sync signals. To make use of this circuit, an unconventional grid biasing method becomes necessary.

2. It will be noted that the grid circuit of T2 is connected to "B" plus through resistors R6, R4 and R5 and to ground through resistor R3. This group of resistors acts as a voltage divider, across "B" plus. The positive voltage impressed on the grid causes a plate current through the cathode bias resistor (R7). This bias is opposed to the positive bias from the plate circuit and, as a result, the actual grid bias with respect to ground is approximately plus 3 volts. The positive bias assures a condition of plate current conduction until cut-off action is initiated by the negative pulse from the horizontal sync signal.

The assymetrical multivibrator, consisting of tubes T3 and T4, actually a single dual triode 6SN7, is the same circuit as covered in the text on pages 44 and 45 with accompanying Figure 59. It will be noted that the time constant of tube T4 grid circuit is approximately ten times that of tube T3. The short time constant of T3 corresponds to the retrace period, while the longer time constant of T4 controls the active trace portion of the sawtooth wave.

As in multivibrator circuits previously discussed, the free running frequency is controlled by the time constant of capacitor C9 and the series combination of R11 and R12. R12 is made variable to act as the vertical "hold" control.

An interesting circuit variation is the use of capacitor C12 as a combined sawtooth generator and coupling means to the vertical output tube (T5). The bias voltage of tube T5 is determined by a balance of the cathode voltage drop across R15 and R16, and a positive voltage from the "B" supply through R14 and R13. The net bias voltage of the tube is approximately plus 7 volts. Capacitor C12 is charged from the "B" source through R14 and R13. R14 acts as the vertical "size" or "height" control. It will be noted that R14 controls not only the plate voltage of T4 but also the screen voltage of the vertical output tube (T5). Since the amplification of a pentode is partially dependent on the screen voltage, this control exerts a dual influence on the overall gain of the vertical system and hence the height of the picture.

The adjustable cathode bias resistor (R15) serves as a "linearity" control. A slight amount of inverse, or negative, feedback occurs in this stage due to the connection of C12 to the cathode of the tube, rather than to ground. This feedback assists in improving the linearity of the sweep applied to the deflection coils.

Two new circuit elements, capacitor C13 and resistor R17, appear in connection with the output transformer. As in the circuit of Figure 73 and its explanation on pages 62 and 64, the secondary of the vertical output transformer (L2), and the vertical deflection coils, are tuned to resonate at a frequency such that the first half cycle corresponds to the vertical retrace time (500 - 750 microseconds). (See Figure 66, Page 53.) When the plate current of vertical output tube is suddenly cut off by the negative swing of voltage on its grid, as shown in Figure 64D, the "ringing", or oscillation, of the output circuit causes a rapid retrace of scanning. Any tendency of this circuit to continue in a state of oscillation is suppressed by the damping resistor (R17).

Horizontal Deflection System. The horizontal deflection system of this general class (Example 2, Figure 81) is similar in some respects to that described in Example 1, since it employs "flywheel", or A. F. C., control of the scanning oscillator by the repetition rate of the sync pulses.

This circuit, Figure 85A, employs the same "sync clipper" tube as was shown in Figure 84A. In this case, however, the grid of the horizontal "sync amplifier" is coupled directly to the plate of tube T1 by means of capacitor C2. This allows the short time (5 microseconds) pulses to be passed directly to the A. F. C. circuit through amplifier T2.

The sawtooth generation is accomplished by a cathode-coupled multivibrator rather than a sine wave oscillator. A "sample" of the scanning wave voltage is taken from the output transformer secondary L5 and injected into the series diode discriminator, or "phase detector", where it is compared with the repetition rate of the horizontal sync pulses.

The direct current output of discriminator tubes T3 and T4 is applied to the grid of

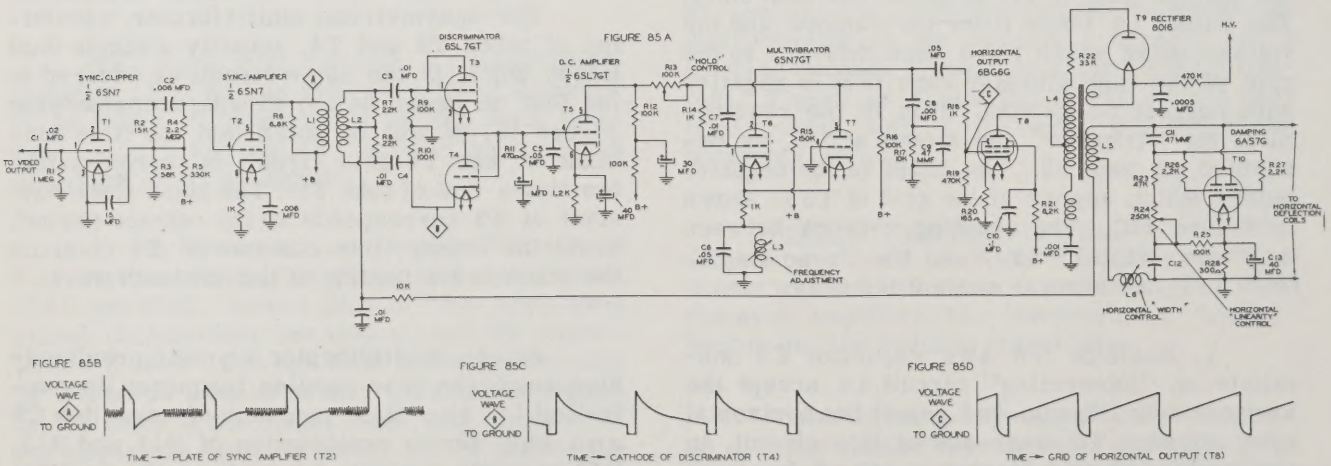


Fig. 85. Electromagnetic Deflection Systems - Example 2. Horizontal Circuit

a DC amplifier. It will be noted that a high-mu twin triode (6SL7-GT) has been employed as a dual-diode by connecting the grids and plates of the respective sections to each other. The plate resistance of amplifier tube T5 is part of the discharge resistance network which determines the operating frequency of the cathode-coupled multivibrator.

The function of this DC amplifier tube (T5) is similar to that of the reactance tube (T4) of Figure 83A. The resistor discharge network comprised of R12, R13, R14 and the plate resistance of tube T5 controls the time constant of the multivibrator grid circuit tube (T6). One of these resistors, R13, is made variable to adjust the free-running frequency, and therefore, acts as the horizontal "hold" control. The tuned circuit in the cathode return of tubes T6 and T7, consisting of capacitor C6 and inductor L3, is an additional control of the free-running frequency of the multivibrator. This is a service or "semi-fixed" adjustment, and is used to set the range of the "hold" control so that it operates symmetrically about its mid-position.

The operation of the remainder of the circuit, consisting of horizontal output tube (T8) and damping tube (T9) needs no further explanation at this time since it has been described on pages 62 through 67.

Figures 85B, 85C and 85D show the waveforms found at various points in this circuit. The wave of Figure 85B requires explanation since it differs from the series of single horizontal pulses delivered to the grid of T2 by the "sync clipper" (T1). It consists of a positive "pip" followed immediately by a negative "pip". The reason for this action lies in the fact that the plate load of tube T2 consists of the primary of the discriminator transformer (L1). When a square wave pulse of plate current passes through the inductance, magnetic flux is generated during the rapid rise of current at the leading edge of the pulse, and the rapid fall of current at the trailing edge. Since these current changes are in opposite directions, they produce the waveform of Figure 85B.

ELECTROMAGNETIC SYSTEM - - EXAMPLE 3. Example 3 in the chart of Figure 81, uses blocking oscillators in both the vertical and horizontal deflection systems. This combination has been employed mainly in table models using the 7DP4 or the 10FP4 picture tubes. Synchronization of both oscillators is caused by "triggering" action of the "clipped" and "shaped" pulses. Figure 86 shows both the vertical and the horizontal deflection circuits of a typical commercial receiver employing this combination.

Vertical Deflection System. The circuit employs the following elements: a "sync amplifier", a diode "clipper" or "sync leveler", a "sync separator", an "integrating" circuit, a blocking oscillator, and a vertical output tube.

The video signal, with its vertical and horizontal sync pulses, is impressed on the grid of the "sync amplifier" tube (T1), Figure 86, through a coupling network comprised of C1 and R1. This stage is a normal voltage amplifier, biased so as to amplify the signal without change in waveshape. The polarity of the video signal applied to the grid of T1 is such that the sync pulses are in the positive direction in its plate circuit.

Diode T2 is connected, by coupling capacitor C2, across the plate load resistor (R2) of tube T1. The diode load resistor (R3) also acts as the grid resistor of "sync separator" tube (T3). The resistor is returned to a negative bias supply of -20 volts and this bias performs two functions:

1. It causes tube T3 to act as a "detector", since it places operation beyond plate current cut-off. Under this condition of operation, only the most positive portion of the input signal (the synchronizing pulses) causes plate current flow. Thus the tube T3 can separate or "clip" the sync pulses.

2. This negative voltage also acts as delay bias for the diode "clipper" or "leveler" tube (T2). When the level of the amplified pulses, appearing across plate load resistor (R2), exceeds this delay bias, rectification occurs in diode T2 causing a negative voltage to appear across the diode load resistor (R3). This voltage adds to the normal bias and is in effect an A.V.C. voltage for the control of sync separator tube (T3). This "levels" the line of sync pulses so that each recurring pulse in the output of tube T3 is of an equal amplitude.

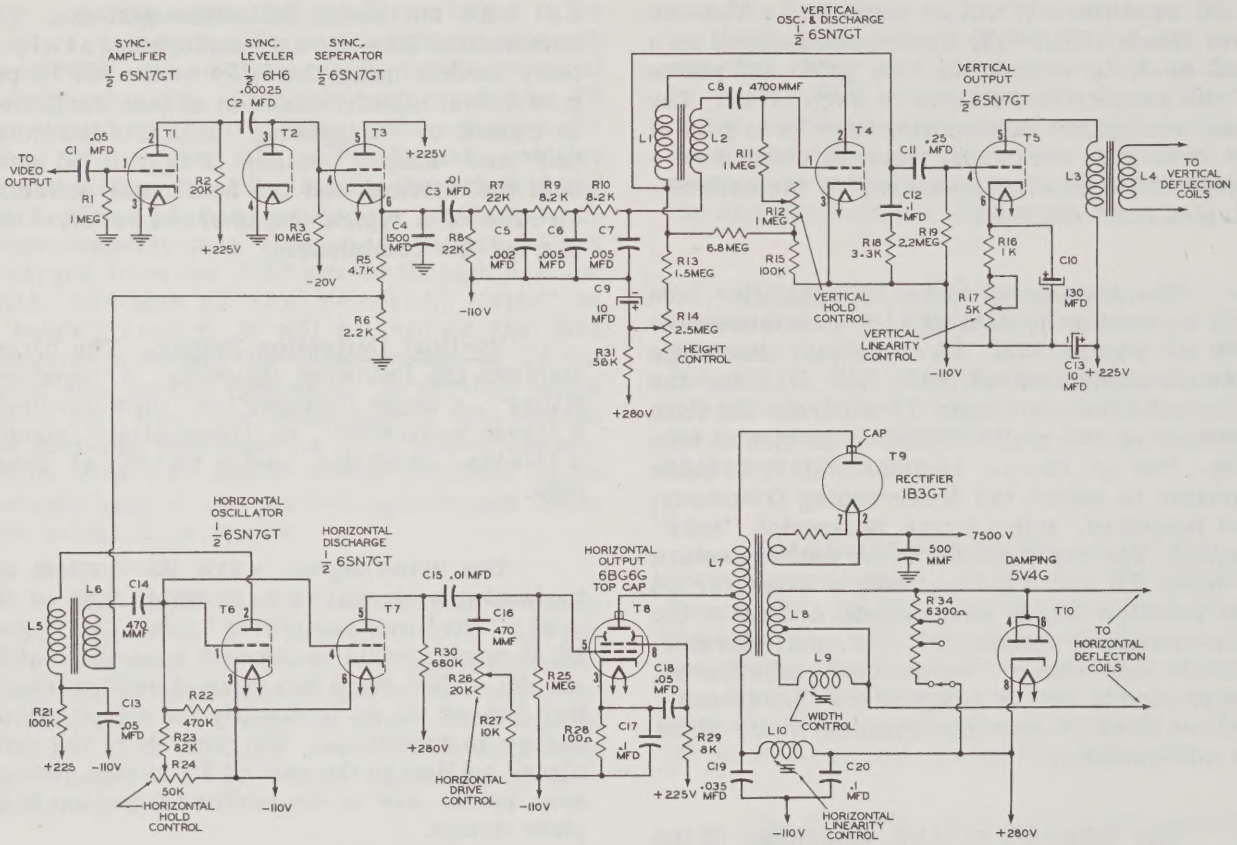


Fig. 86. Typical Electromagnetic Deflection System - Example 3

The series combination of resistors R5 and R6, in the cathode circuit of T3, acts as the output load of the sync separator, and feeds the separated pulses to both the vertical and horizontal systems. The integrating network, for acceptance of the vertical sync signal, is composed of capacitors C3, C4, C5, C6 and C7 together with resistors R7, R8, R9 and R10.

Control of the blocking oscillator tube (T4), by the sync pulses, is accomplished through series injection in the grid circuit as covered on pages 54 and 55. The action of the blocking oscillator is the same as that described and illustrated on pages 47 and 48, with the exception of the addition of peaking resistor (R18) in series with the sawtooth forming capacitor (C12).

Vertical "hold" is controlled by R12 in the grid circuit and vertical "height" by R14 in the plate circuit, as previously covered.

The action of vertical output tube (T5), with its cathode bias control of vertical "linearity", has been covered previously.

Horizontal Deflection System. The horizontal deflection system is similar to that described on pages 61 - 64 and illustrated in Figure 73, with the substitution of a pulse "triggered" blocking oscillator for the A. F. C. controlled sine wave generator. The elements of the circuit are: a blocking oscillator, a discharge tube, a horizontal output tube and a damping tube.

Horizontal sync pulses are fed to the grid of the blocking oscillator tube (T6) from the voltage drop across resistor R6 in the cathode circuit of the sync separator tube (T3). The circuit consisting of resistor R6 and the secondary L6, with its distributed capacitance, accept the horizontal pulses and reject the vertical group. Blocking oscillator tube T6 is thus controlled by the sync pulses and proper scanning occurs.

The grid of horizontal discharge tube (T7) is directly connected to the grid of the blocking oscillator tube (T6) and functions as described on page 49. The sawtooth generating and peaking circuit, consisting of C16, R26 and R27, is discharged or triggered by plate conduction of tube T7 as controlled by the oscillator tube (T6). Resistor R26 is made variable as a horizontal "drive" control. The action of this control was discussed on page 65.

The action of the remainder of the circuit (horizontal output, damper, and high voltage rectifier) have been covered previously.

Figure 87 shows a commerical variation of the blocking oscillator which has several unusual features. The feedback action involves the use of both sections of a high-mu twin triode (6SL7GT). The input section (T1) operates with cathode bias due to its plate current flow through R2. This establishes a negative bias as shown in Figure 87B. T1 is coupled to the cathode of a "grounded grid" triode T2. The plate of T1 feeds the cathode of T2 through C3.

The unusual feature of this circuit is the incorporation of a tuned circuit comprised of L3 and C4 in the plate return of T1. The combination of L3 and C4 is tuned to a frequency slightly lower than the horizontal scanning rate of 15,750 cycles per second and is shock excited by the pulse action caused by feedback through transformer windings L1 and L2. The sudden positive pulses shown in Figure 87B have an action similar to the "push" given a pendulum in a "grandfather's clock" by the mechanism. The mechanical pulses are correctly timed to sustain the simple harmonic motion. The action of the electrical pulses results in a condition of sustained oscillation in which the voltage wave across L3 is practically sinusoidal. (See Figure 87F.)

The C-R circuit in the cathode of T2, consisting of C3, R3 and R4, has a variable time constant of from 15 to 30 microseconds (see page 36) and by adjusting R3 it is possible to effect small changes of the free running frequency. Resistor R3, therefore, functions as a "hold" control. It will be noted from the waveform of the cathode to ground voltage (Figure 87D) that the combination of pulse action and capacitor discharge produces a sharply peaked input to T2.

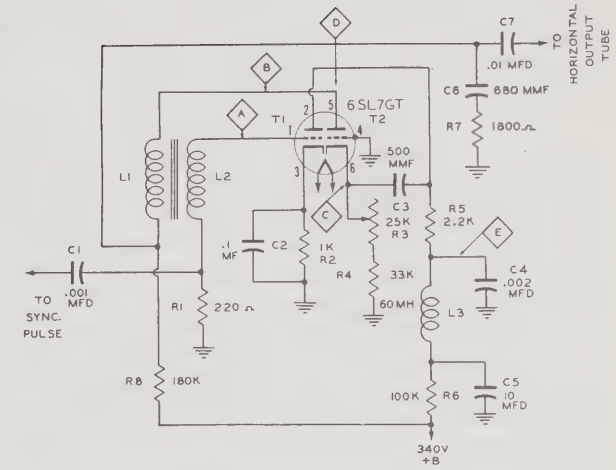


FIG. 87A

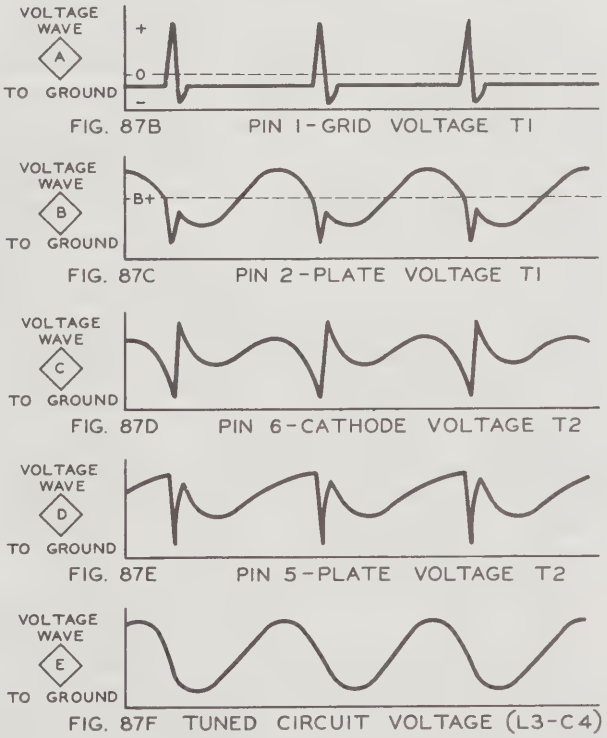


Fig. 87. A Variation of the Blocking Oscillator

The plate current conduction pulses of T2 (see Figure 87E) "trip" the charge on the sawtooth and pulse forming circuit C6-R7. The path of this discharge action includes transformer primary L1, the internal plate to cathode path of the tube T2, and parallel circuits from cathode to ground comprised of R3, R4 and C3, R5, C4.

This oscillator is very stable in action due to the "flywheel" effect of the tuned circuit (L3-C4). It is not readily tripped by random noise pulses which arrive at times other than the synchronizing pulses.

ELECTROMAGNETIC SYSTEM - - EXAMPLE 4. In the combination example 4, Figure 81, the horizontal circuits are identical to those described under Example 2, and illustrated in Figure 85A. The vertical system, however, exhibits several interesting features and merits description.

Vertical Deflection System. The elements of this system include: a sync "clipper", an integrating circuit, a vertical sync amplifier, a blocking oscillator and a vertical output tube. Figure 88 shows the circuit details of this combination.

Tube T1, a sharp cut-off pentode (6SH7), operates at low plate and screen potentials and is self-biased by grid circuit rectification of the video signal impressed through C1 and R1. Under these conditions, only the positive peaks of the input signal cause output plate current. Thus the sync pulses are "clipped" from the video signal.

The sync signals are passed to the vertical sync amplifier tube (T2) through a three stage integrating circuit (R5-C4, R6-C5, R7-C6). The sync pulses, having been inverted in polarity through tube T1, arrive at the grid of tube T2 as a negative voltage swing which drives the tube to cut-off. This results in positive "going" pulses in the plate circuit which are of the proper polarity for the control of the blocking oscillator circuit. It will be noted that tube T2 is given a small initial positive bias from the "B" plus supply through a one megohm resistor (R8). Since this tube is a high-mu triode (6SL7GT) these operating conditions result in a large swing of plate voltage under control of the sync pulse. It will be noted that the entire swing of the plate voltage of tube T2 is applied to the secondary (L2) of the blocking oscillator feedback transformer.

The blocking oscillator is conventional in its circuit features. As in the systems previously described, grid circuit resistor (R12) acts as the vertical "hold" control and plate supply resistor (R15) serves as the "size" or "height" control.

The vertical output stage (T4) employs a power pentode (6L6GT) with the feedback method of linearity correction from the cathode circuit. Variable bias resistor (R18) controls vertical "linearity".

ELECTROMAGNETIC SYSTEM - - EXAMPLE 5. In the deflection system listed as Example 5 of chart Figure 81, the only element which we have not previously considered is the "oscillating output stage" or "beam relaxor". Circuits of this general type, in which the generator itself supplies the deflection current, are also called "current oscillators".

Figure 89 shows a version of this type output stage which has been used in a number of models now on the market. In this circuit a beam power pentode (6L6) has its control grid connected to the secondary (L3) of the output transformer, with proper polarization to cause oscillation. The screen grid of this pentode is coupled to the plate of a sync pulse clipper and can inject a voltage pulse at the

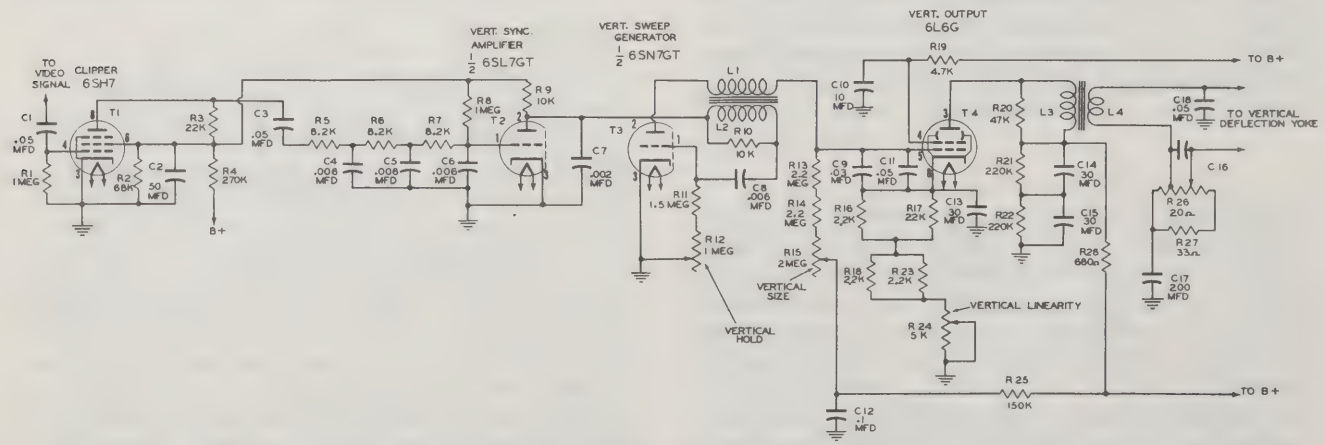


Fig. 88. Electromagnetic Deflection Systems - Example 4. Vertical Circuit

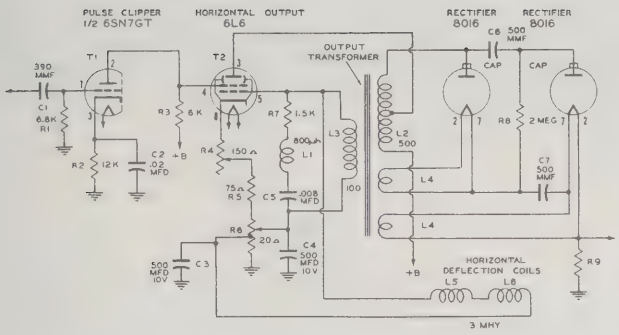


Fig. 89. Oscillating Horizontal Output Stage

correct time to synchronize the frequency of oscillation with the rate of the horizontal sync pulses. Since the action of this circuit differs considerably from any which we have previously considered, a step by step analysis of its operation follows:

1. As a starting point, let us assume that the plate current of the tube has just been cut off, by the negative sync pulse at the screen or by the oscillator action itself. This cut-off occurs at the instant that retrace of scanning starts a new line. The magnetic flux stored in the transformer collapses inducing a high negative voltage on the grid. This collapse of magnetic flux, and its resultant voltage change across the horizontal deflection windings, produces the change in polarity necessary for retrace of the scanning wave.

2. A series circuit consisting of R7 (1.8K ohms), L1 (800 microhenries), and C5 (.008 MFD) is connected across this winding. This network critically damps out any tendency for continued oscillation. Following retrace, the grid potential grows less negative until plate current starts to flow.

3. The rate at which the plate current will flow is determined by:

   a. The plate resistance of the tube, which is controlled by the cathode bias network. Since we are now considering the trace or linear part of the cycle, the influence of the variable portion of the cathode circuit resistance (R4) can act as a horizontal "hold" control.

   b. The inductive load in the plate circuit. This consists of the plate to "B" plus part of winding L2 with the reflected effect of secondary grid winding L3.

4. The time constant of a circuit consisting of inductance and resistance is determined by the ratio of L to R. When an inductance is suddenly disconnected from a source of direct current and allowed to discharge its stored energy through a resistor, a change of current, with time, will occur which is identical in shape to the change of the voltage wave discussed in connection with capacitor sawtooth wave forming circuits.

With an effective plate circuit inductance of 60 millihenries and an AC or dynamic plate resistance of 500 ohms, the L/R ratio corresponds to the required time constant for 15,750 cycle scanning. These conditions are met in the circuit of Figure 89.

5. As the sawtooth current wave builds up in the plate circuit, it induces a similar wave, by transformer action, in winding L3, which supplies the horizontal deflection coils and the grid of the "beam relaxor".

6. As the current wave increases in amplitude, a point is reached at which the grid voltage has become sufficiently negative, with respect to the cathode, to produce plate current cut-off. It will be noted, by examining the plate current versus plate voltage curves of the 6L6 beam pentode, that there is a sharp "knee" in the curve after which the plate current reaches saturation. In this circuit, the action takes place by sweeping rapidly from the region below the "knee" of the curve to the saturation region. The saturation or flat region corresponds to the active sweep. The low current region below the "knee" corresponds to the retrace period.

In a "beam" pentode, a negative pulse of voltage applied to the screen will cause a sharp increase of applied plate voltage. The pulse is supplied in this circuit, by the pulse clipper tube (T1). This initiates the retrace cycle and assures "lock-in" with the video signal.

ELECTROMAGNETIC SYSTEM - - EXAMPLE 6. The circuits of the combination outlined as Example 6 (Figure 81) are similar to those of Example 2, with the exception of a different type horizontal oscillator sync control. While, for simplicity, it has been listed as an A. F. C. control, in reality "pulse width control" would be a more accurate description.

Figure 90 shows the essential details of this system, which include a sync clipper, a

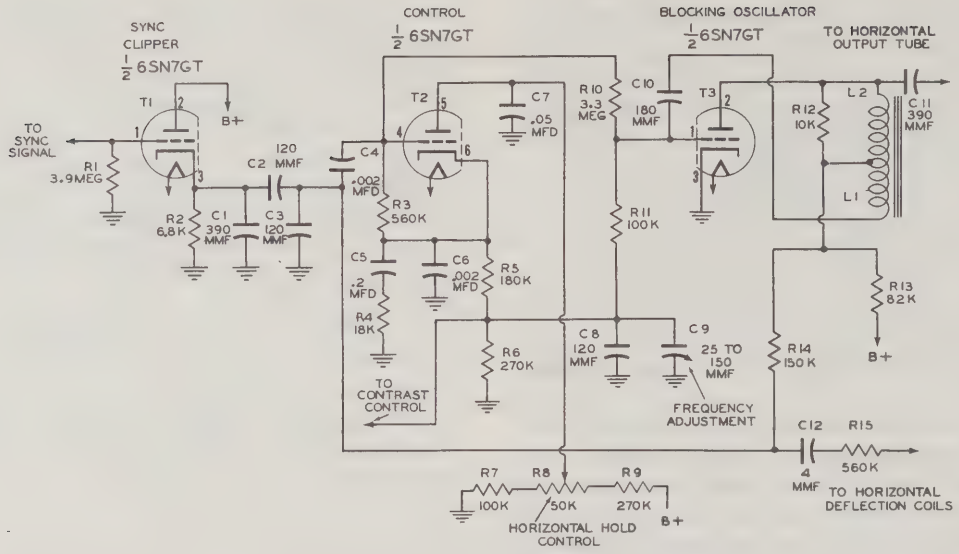


Fig. 90. Automatic Pulse Width Control of Blocking Oscillator

control tube, and a blocking oscillator. The other elements of the system have been fully covered.

The pulse output of the clipper (T1) which appears across the cathode resistor (R2) is positive with respect to ground. This pulse is applied to the grid of control tube (T2) through the differentiating network consisting of C1, C2, and C3. The action of the remainder of the circuit involves simultaneous events which can best be described in sequence:

1. The control tube (T2) fulfills a number of functions, namely;

   a. Since a portion of its cathode circuit, resistor R6, is common to the grid circuit of the blocking oscillator tube (T3), it is able to affect the frequency of oscillation by influencing the time constant of the circuit comprised of C10, R11 and R6 (paralleled by C8 and C9).

   b. The voltage drop across R6, due to the plate current of tube T2, can be controlled by potentiometer R8, which adjusts the plate voltage. R8 constitutes the horizontal "hold" control.

   c. Tube T2 serves as a means of automatic frequency control of scanning by "mixing" the original pulse from tube T1, a signal fed back from the output of the blocking oscillator tube (T3), and a pulse from the horizontal deflection coils through R15 and C12.

2. The pulse voltage derived from the deflection coil is that which occurs at the instant of retrace. It is "sharpened" by network R15 and C12. This pulse is negative with respect to the original sync pulse.

3. A small portion of the sawtooth voltage in the plate circuit of the blocking oscillator tube (T3) is also fed back through resistor R14 to the grid of control tube (T2). This voltage is positive (the same polarity as the original sync pulse) and is combined with the sharp negative pulse from the deflection coil. The result of this combination produces a sawtooth which has a very sharp or vertical return.

4. The combination voltage just described is applied to the control tube grid. It will coincide with the original sync pulse only if the oscillator is in exact step with the video sync pulses.

5. As exact synchronizm is reached, the control tube grid pulse, which consists of the original sync pulse added to the fed back pulse, will be narrow and of high amplitude. If the fed back pulse is slightly fast or slow it will not add to the original sync pulse, but instead will have the effect of widening the original pulse.

6. From this combination of variable width and height of the voltage pulse on the grid of tube T2, a very precise timing is achieved.

7. The plate current pulse of tube T2, flowing through cathode resistor R6, adjusts the grid circuit time constant of the blocking oscillator tube T3 and produces the required exact synchronization.

Installment No. 8 will begin the study of Beam Modulation and Synchronization.

The PHOTOFACT Servicer

AUG. 15, 1948 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ VOL. 5, No. 44

ROBERT M. ELLIS, *Editor*

LONG PLAYING RECORDS

As we go to press, the radio industry is in somewhat of a turmoil over the introduction of a new type of phonograph record with long playing time characteristics. Twenty-seven minutes of playing time are available from 10-inch records—45 minutes from the 12-inch size.

These long playing characteristics become possible from a combination of two factors—"microgroove" construction of 240 lines per inch; and a slower turntable rotation of 33⅓ r.p.m. instead of the customary 78. These radical revisions of standards require a new type of stylus with a radius of only 1 mill and a needle point pressure of only 5 grams, we are told. It will be readily seen that new records will not be playable on any existing phonograph mechanisms.

Because of our intimate connection with the leading record changer manufacturers we have had knowledge of this development for some time; but naturally, we have had to respect confidences. Now that the "wraps" have been taken off this development, we expect to give you full details so that our readers will be able to cope with the service problems likely to be encountered.

As an aggressive service technician you will welcome the service opportunities affected by the new "microgroove" long playing record development. Further details will appear in the next issue of the "Servicer." PHOTOFACT Folders will be issued to cover the new changers and players; so that our subscribers will be kept up-to-date in the progress of the art; and complete service information will be provided.

★ ★

NEW TELEVISION PERFORMANCE

On the evening of July 14th, from the comfortable depths of arm chairs in an Indianapolis suburban home, a group of Sams' engineers viewed scenes of the Democratic National Convention. The program was "telecast" on channel 4 from WBKB of Chicago, with a delay of only some four hours after the actual events. This truly remarkable feat was accomplished by a series of new techniques. (The four hour interval is unusual and is not to be expected as a pattern that will prevail.)

As reported by WBKB, the program originating in Philadelphia was piped to New York City via co-axial cable. In the New York laboratory of Paramount, motion pictures were made of the scenes as they appeared on the face of a cathode-ray tube, and the accompanying sound was recorded on the edge of the film in the conventional manner. We were told that newly developed techniques resulted in finished films being available after only 66 seconds of processing time. The resulting films were rushed to the airport and flown to Chicago. The end results were good—of high entertainment value, even when viewed from the fringe reception area of our far beyond line-of-sight location.

In PHOTOFACT SERVICER *No. 25 of September 18, 1947, we said:—*

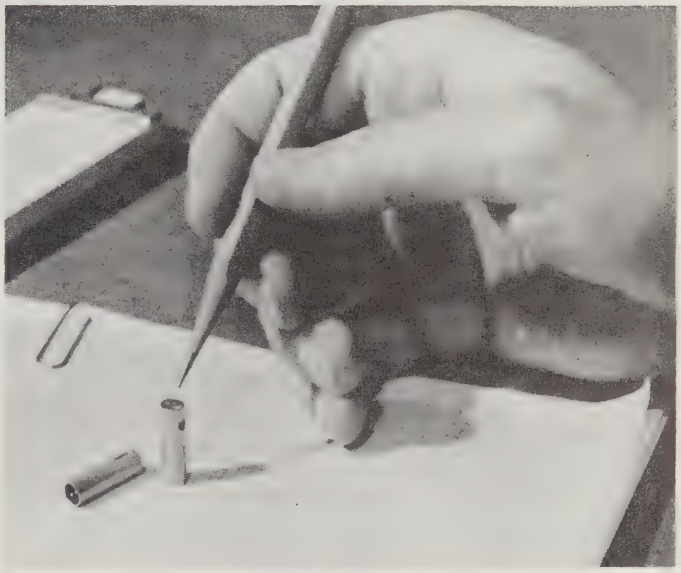
"We see no sound basis for the viewpoint that television on a nationwide scale must wait the availability of coast-to-coast net-works of co-axial cable, constructed at fabulous sums. We think the answer lies in the use of movie film, for commercial programs, for live talent shows away from the studio, and for news; and at the risk of sticking out our neck at least a mile, we will bet dollars to doughnuts that film will form the back-bone of television programming when television becomes a national institution."

It seems that our hunch is proving true.

★ ★

THE TRANSISTOR

Take a good look at the gadget shown above, because it promises to be the most revolutionary development that has hit the radio and electronics field since Lee DeForest invented the three-element vacuum tube. The device is called a "Transistor" and it is the invention of the Bell Telephone Laboratories, which functions as a research section with Western Electric in the A. T. and T. System.



Photograph Courtesy Western Electric Company

The Transistor can be most easily described to the service technician as a modified crystal detector that can rectify, oscillate, or amplify. In short, the Transistor can perform almost every function of a vacuum tube. There is no heated cathode so that the device is instant starting. It uses only a very small amount of polarizing energy—Bell says less than one-tenth the energy required for an ordinary flashlight bulb.

To date the Transistor has been used to amplify frequencies from audio to ten megacycles, and gains up to one-hundred (20 d.b.) have been secured. While the Transistor is still a laboratory curiosity, Bell has already demonstrated a "tube-less" radio receiver with Transistors.

The "works" of a Transistor are simply two hair-thin wires touching a pin-head of solid semi-conductive material soldered to a metal base; the whole assembly is enclosed in a tiny metal cylinder, as shown in the illustration. There is no vacuum, grid, plate or other parts associated with a vacuum tube. Over a hundred "Transistors" can easily be held in the palm of one's hand. Because of the basically simple structure of these new units, stability and long life are expected.

It is far too early to hazard any guess on a time schedule for the commercial progress and application of the Transistor. Operating as it does on entirely new physical principles, a world of development must occur before the full potentialities of the device will be explored. Over half a century of theoretical and applied physics lie behind the conventional vacuum tube; and we are still finding out things about it. Research tools have been tremendously advanced in recent years so that exploration of the Transistor should go on at a rapid pace.

The field of application of any product is limited by economic consideration; and since the Transistor has not been produced in commercial quantities, its costs are unknown. However, the future for the Transistor looks big to us. It will pay you to keep your eye on this new development.

★ ★

FIELD EXPERIENCES

Here is your opportunity for passing practical service experiences to others for the benefit of all. For every service "Field Experience" published, we issue to the author a certificate that is good for one PHOTOFACT Folder Set. Since it is impossible to verify the accuracy of

contributions, we cannot be responsible for either the diagnosis made of the receiver trouble, or the results which will be obtained by following the suggested repair routine. All contributions become the property of Howard W. Sams & Company, Inc.

★ ★

FILING FIELD EXPERIENCES

"We keep a separate three-ring binder on the same shelf with our PHOTOFACT volumes, in which we file PHOTOFACT SERVICERS in numerical order. Then we select the Folder for the set referred to in each 'Field Experience' and write the number of the SERVICER on the first page. This establishes a quick cross-reference system without mutilating the SERVICERS. We file the television course Folders in the same binder, thus making a convenient study and reference handbook."

Submitted by: Mr. W. J. Slack
30 Hull Street, East Meadow, L. I., N. Y.

★ ★

GENERAL INSTRUMENT 205 RECORD CHANGER
Photofact Set No. 10

"As the needle entered the change groove near the center of the record, it would kick back in the record and repeat, playing the last few grooves of the record instead of going through a change cycle.

Cause: The shielded lead to the pickup was pulled tight where it enters the back end of the pickup arm, causing tension on the arm as it approached the center of the record.

Cure: Add some slack in the shielded lead where it enters the back end of the pickup arm. In some sets this lead is held by a clamp under the changer base or inside the cabinet, in which case it may be necessary to loosen the clamp to obtain enough slack."

Submitted by: Mr. John L. Stevens
825 Seventh Street, Columbus, Indiana

★ ★

PHILCO 46-350
Photofact 4610-24, Set 10

"Noise and intermittent reception sounding like shorted tuning condenser plates in these models may be traced to poor soldered connections at the stator terminals of the tuning condenser. These terminals are located underneath the condenser and the leads to them come up through the chassis. The remedy is to resolder, and a small tipped soldering iron is required for the job."

★

WESTINGHOUSE H161
Photofact 484-27, Set 34

"Poor sensitivity on F.M. in several of these sets was found to be misalignment of the I.F.

We found that the two F.M. leads of the first I.F. transformer were brought through the chassis in the hole provided for the adjustment trimmer A14 instead of the hole provided especially for them. These orange and the blue leads both go to the rear section of the band switch. After these two leads were brought through the chassis properly, the set was aligned per instructions, and it performed up to standard. It was impossible to properly align the I.F. with the leads in the original position as the alignment tool would disturb the circuit. The wiring is clearly shown on the bottom chassis view on Page 3 of the PHOTOFACT Folder. The clearness of the photograph saved much time on this one."

Submitted by: Mr. C. W. Battels, Battels Radio-Electronics Service
559 Wooster Avenue, Akron 7, Ohio

★ ★

PHILCO 46-1201 (Revised)
Photofact 4719-21, Set 29

"Complaint: Very low volume.

"Cause: Open antenna coil. Due to the fact the input grid circuit has a return to the a.v.c. line, the usual grid hum is missing. In some cases, we have found that the break was caused by the customer fastening the coil in place with thumb tacks."

TRUETONE

"We have had several models in the shop with a complaint of intermittent operation. We have discovered in nearly every case that the windings of the grid section of the midget oscillator coil had not been soldered to the coil lugs at time of manufacture. Resoldering all lugs always remedies this fault."

★

OAK 6666 RECORD CHANGER
Photofact 479-35, Set 19

"We have had quite a few of these which developed a clicking noise. Referring to Folder 479-35, Page 3, bottom view, we have found in every case that the starting pawl, PHOTOFACT Item 48A, is slightly too long and allows the pinion dogs to hit it when the turntable is revolving. The only remedy we have found is to carefully file the end of the pawl until it clears the dogs in the playing position.

"This changer is used in Truetone Models, in addition to other brands mentioned in the Folder."

★

TRUETONE D1752
Photofact 484-25, Set 34

"Complaint: Dead FM band.

"Upon checking we have found that the i.f. transformers and r.f. trimmers in the FM section are not sharply aligned. In every case a careful alignment of the i.f. transformers first and then the two r.f. trimmers has made the FM very good. We might mention that we have had this same trouble on several models and makes of radios which have FM bands. These adjustments are very critical at the high frequencies involved."

★

TRUETONE D3810 PORTABLE
Photofact Folder 27, Set 39

"We have had several of these which would not play on battery. On checking, we found that one or more of the brass contact springs in the 'A' battery box were bent back or broken off. They are bent sharply and crack in the bend. We fix this by bending the springs out so as to make good contact. We then heat carefully the entire spring with a hot iron and run solder inside the bend so that it fills about ⅛" deep. The solder holds both sections of the spring firmly and the heat draws enough of the hardness out of them so they do not break again."

Submitted by: Mr. H. W. Davis, Service Manager,
Quality Radio Service, 1513½ Seventh St., Rockford, Illinois

★ ★

ELECTRONIC LABS "ORTHOSONIC" 710M (Ch. 2875)
Photofact 4710-7, Set 20

"Complaint: Slight buzz on certain points on the dial.

"You will find some sets with two 50L6 tubes that have a half metal external shield at their base. Ground this 'shield' or better still replace with 50L6 tubes that do not have this metal base. The buzz will be removed."

★

VM RECORD CHANGER 400
Photofact 4716-33, Set 26

"Complaint: Changer will not shut off automatically.

"I found that lever spring No. 68 had too much tension, thereby preventing the cut-off lever No. 65 from turning half way around. Bend the spring slightly away from the cut-off lever and the trouble will disappear."

Submitted by: Mr. Frank Teicher,
717 E. 175th St., New York 57, New York

PUBLICATION DATES

When will other sets of PHOTOFACT Folders be published?

Volume 5—Set No. 45	**Sept. 15**
Volume 5—Set No. 46	**Sept. 15**
Volume 5—Set No. 47	**Oct. 15**
Volume 5—Set No. 48	**Oct. 15**

If you have been unable to get any issues of PHOTOFACT *Folder Sets, send your order and money directly to us and we will see that you are supplied.*

AIRCASTLE MODEL
5028

AIRCASTLE MODEL
5028

AIRCASTLE MODEL 5028

TRADE NAME	Aircastle, Model 5028
MANUFACTURER	Spiegel Inc., 1061 W. 35th St., Chicago, Ill.
TYPE SET	Three Power Operated Portable Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types, 1R5 Converter, 1U4 IF Amp., 1S5 Det.-AVC-AF, 3S4 Power Output, 117Z3 Rectifier.
POWER SUPPLY RATING	110-125 Volts AC-DC or 3 Volts "A" Supply and 67.5 Volts "B" Supply .15 Amp. @ 117 Volts AC or 136MA @ 3 Volts DC and 13.2MA @ 67.5 Volts DC
TUNING RANGE—BROADCAST	540-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer parallel with base of dial. Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1 MFD capacitor in series with low side of the signal generator and B-. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to rear stator of tuning cap. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy ant. to 200 MMF to reduce hum modulation.
2	.1 MFD.	"	1650KC	"	"	A5	Adjust for maximum output. Reassemble in cabinet.
3		Wrap one turn of high side of sig gen. around outside of cabinet.	1400KC	Tune for maximum output.	"	A6	Adjust for maximum output. A6 is accessible by removing plug button in end of cabinet.

HOWARD W. SAMS & CO., INC. **Indianapolis Indiana**

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		AIRCASTLE PART No.	STANDARD REPLACEMENT		
1	Converter	1R5	1R5	7AT	
2	IF Amp.	1U4	1U4	6AR	
3	Det.-AVC-AF	1S5	1S5	6AU	
4	Power Output	3S4	3S4	7BA	
5	Rectifier	117Z3	117Z3	4BR	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	AIRCASTLE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	
6A	40	150	EC-14			DY-3x40-150	TA-440	Filter - Red
B	40	150					UT-121	" - Blue
C	20	150						" - Yl.
7	70	10	EC-6		BRH121	M-100-12	UHC-112	Fil. Bypass
8	.05	600	PC-5	684-05	DT6S5	MPH-6-05	TC-15	Line Filter
9	.005	600	PC-6	684-005	DT6D5	S-6-005	TC-25	Output Plate Bypass
10	.005	600	PC-6	684-005	DT6D5	S-6-005	TC-25	Audio Coupling
11	.01	400	PC-7	484-01	DT4S1	S-4-01	TC-11	AF Screen Bypass
12	.005	600	PC-6	684-005	DT6D5	S-6-005	TC-25	Audio Coupling
13	.01	200	PC-7	484-01	DT2S1	S-4-01	TC-11	IF Grid Filter
14	.1	200	PC-3	484-.1	DT2P1	S-2-1	TC-1	Fil. Bypass
15	.05	600	PC-5	684-05	DT6S5	S-6-05	TC-15	AVC Filter
16	.01	400	PC-7	484-01	DT2S1	S-4-01	TC-11	Decoupling
17	.1	400	PC-8	484-.1	DT4P1	S-4-1	TC-1	Line Isolation
18	100		MC-2	1468-0001	5W5T1	MO.5-31	1FM-31	AF Plate Bypass
19	100		MC-2	1468-0001	5W5T1	MO.5-31	1FM-31	Diode RF Filter
20	100		MC-2	1468-0001	5W5T1	MO.5-31	1FM-31	Osc. Grid Cap.

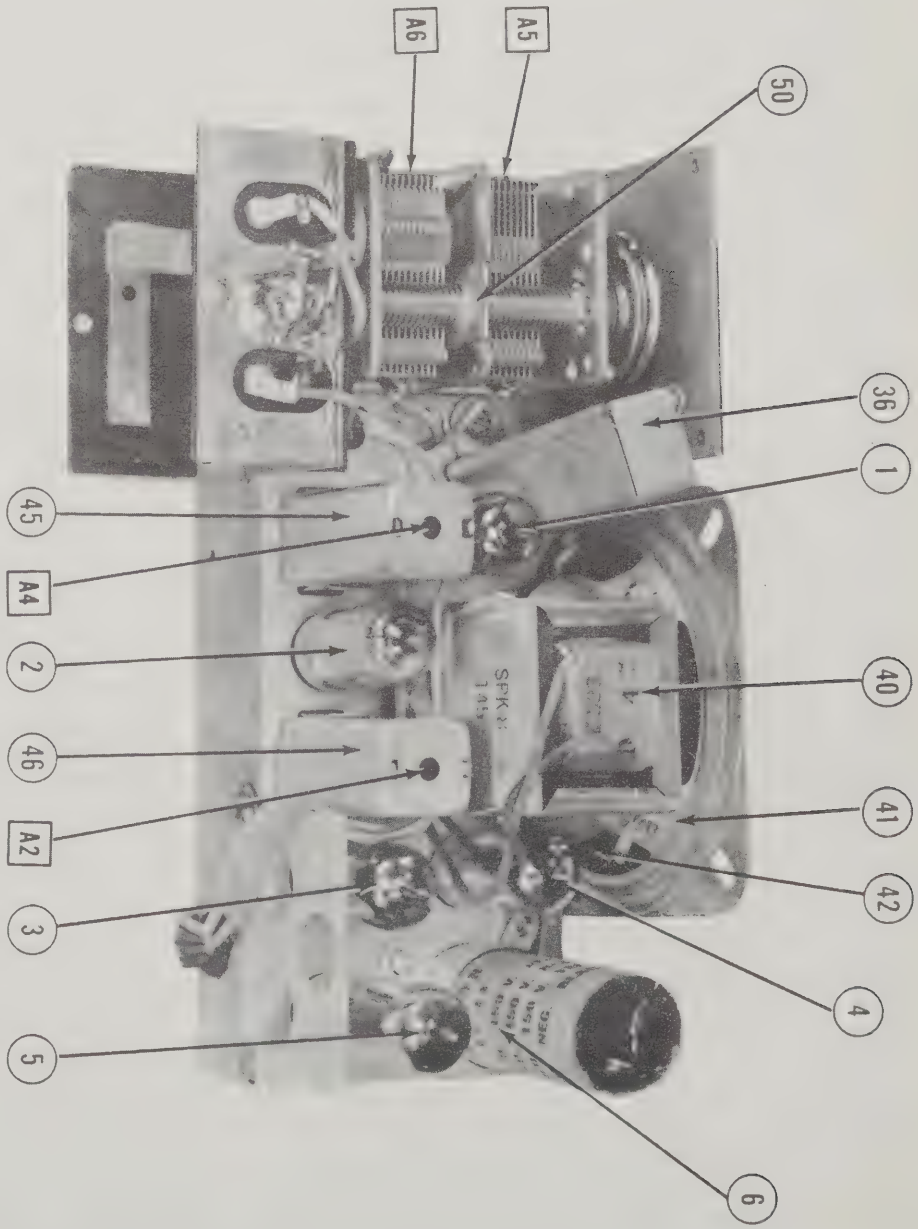
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	AIRCASTLE PART No.	IRC PART No.	CLAROSTAT PART No.	
21	1 Meg.	½	VC-11			Volume Control

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	AIRCASTLE PART No.	IRC PART No.	
22	220KΩ	½	1R-20	BTS-220K	Red-Red-Yl. Oscillator Grid
23	3.3 Meg.	½	1R-23	BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
24	220KΩ	½	1R-20	BTS-220K	Red-Red-Yl. Line Isolation
25	10 Meg.	½	1R-3	BTS-10 Meg.	Br.-Blk.-Blue IF Grid
26	82KΩ	½	1R-31	BTS-82K	Gray-Red-Or. Diode RF Grid
27	10 Meg.	½	1R-3	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
28	3.3 Meg.	½	1R-23	BTS-3.3 Meg.	Or.-Or.-Grn. AF Screen Dropping
29	1 Meg.	½	1R-12	BTS-1 Meg.	Br.-Blk.-Grn. AF Plate Load
30	2.2 Meg.	½	1R-13	BTS-2.2 Meg.	Red-Red-Grn. Output Grid
31	270Ω	½	1R-33	BW-½-270	Red-Vi.-Br. Bias
32	620Ω	½	1R-39	BTS-560	Blue-Red-Br. Filament String
33	270Ω	½	1R-33	BW-½-270	Red-Vi.-Br. Filament String
34	33Ω	½	1R-17	BW-½-33	Or.-Or.-Blk. Filament Dropping
35	470Ω	½	1R-1	BTS-470	Yl.-Vi.-Br. Filament String
36A	1050Ω	5	WR-7	AB-1000	Filament Dropping
B	1050Ω			AB-1000	" "
37	3900Ω	1	1R-40	BTA-3900	Or.-White-Red Filter
38	33Ω	½	1R-17	BW-½-33	Or.-Or.-Blk. Rectifier Ballast
39	10KΩ	½	1R-37	BTS-10K	Br.-Blk.-Or. Screen Decoupling

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRCASTLE PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
40	3700Ω	3.2Ω	410Ω	.7Ω	Part of SPK-8	A-3876*	T22S46*	A-2900*	*Bend mounting tabs down, file out slots and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AIRCASTLE PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	VC IMP.				
41	PM	3.2Ω	SPK-8			
	CONE DIA.	VC DIA.				
42	3-7/16"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

R F COILS

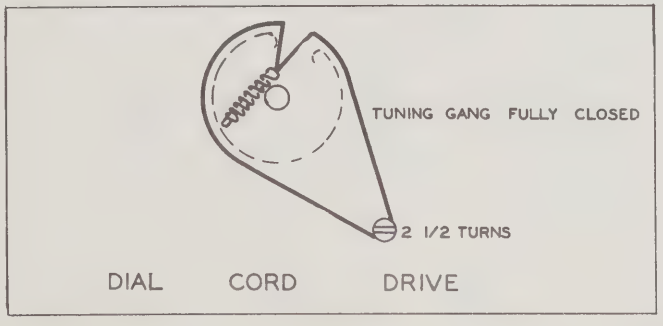
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	AIRCASTLE PART No.	MEISSNER PART No.	
43	Loop Ant.		1.9Ω	LL14		
44	Osc. Coil	.3Ω	1Ω	LO8	14-1040	
45	Input IF	22Ω	22Ω	LI5	16-6668	
46	Output IF	22Ω	22Ω	LI5	16-6669	

BATTERIES

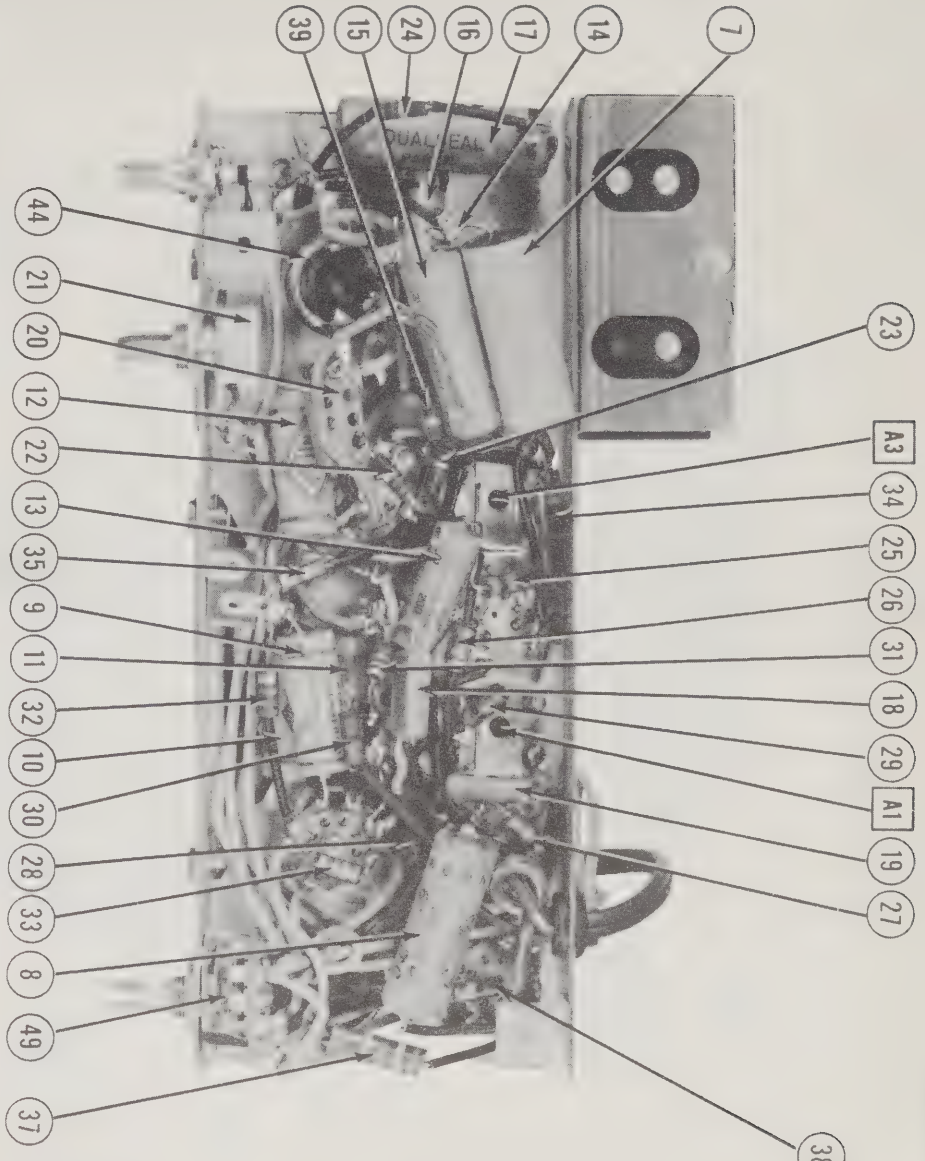
TEM No.	VOLTAGE	AIRCASTLE PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
47	3V "A"		#950			2R			2 Used in series
48	67.5V "B"			#467			XX45		

MISCELLANEOUS

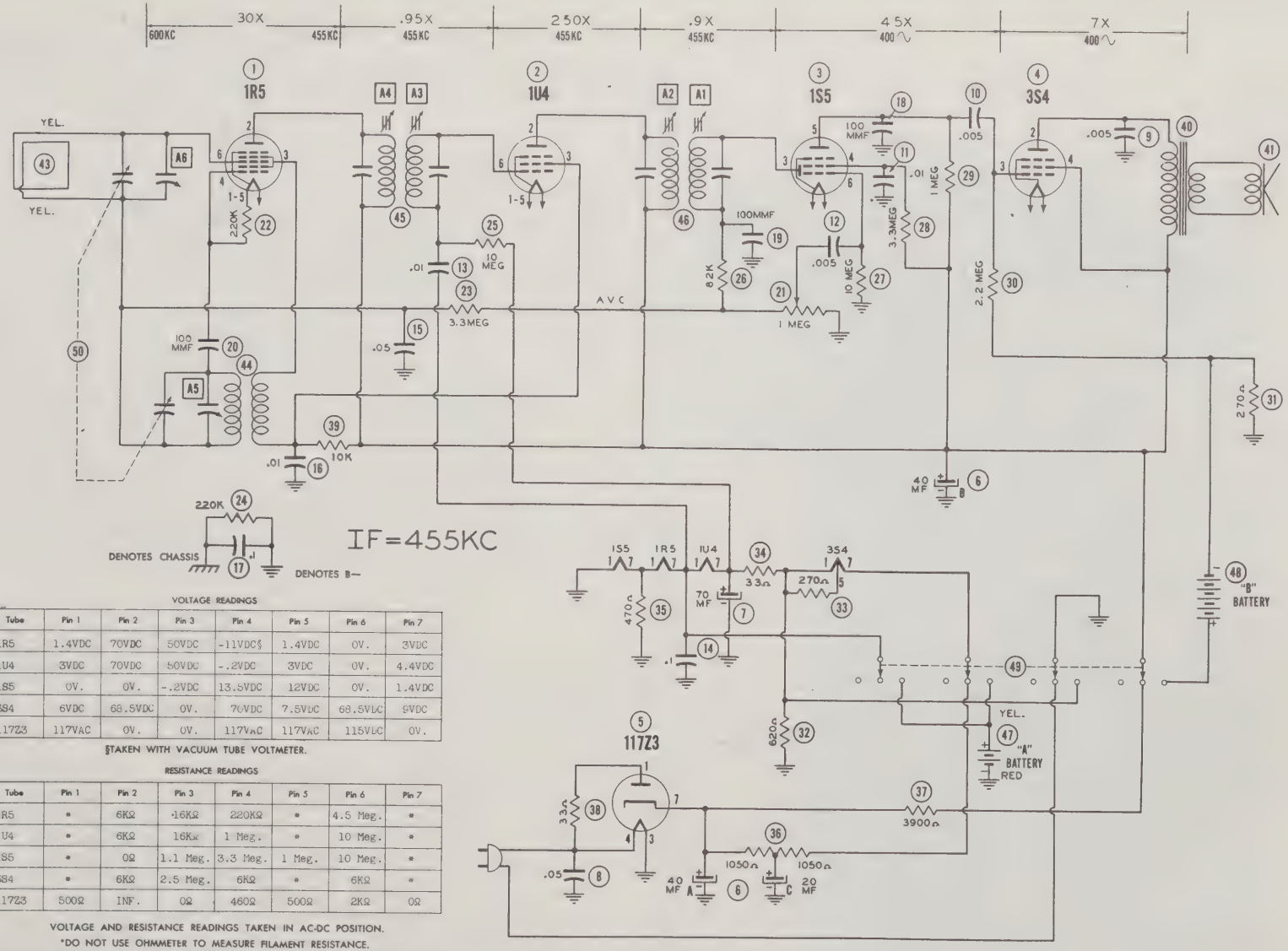
ITEM No.	PART NAME	AIRCASTLE PART No.	NOTES
49	Switch	SW-8	On-off, AC-DC, Batt.
50	2 Gang Var. Cap.	GC-6X	(17-457MMF, 33-200MMF)
A5	Trimmer	G-4	Osc. Adj.
A6	"	G-1	Ant. Adj.



CHASSIS—BOTTOM VIEW



AIRCASTLE MODEL 5028



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	1.4VDC	70VDC	50VDC	-11VDC§	1.4VDC	0V.	3VDC
2	1U4	3VDC	70VDC	50VDC	-.2VDC	3VDC	0V.	4.4VDC
3	1S5	0V.	0V.	-.2VDC	13.5VDC	12VDC	0V.	1.4VDC
4	3S4	6VDC	68.5VDC	0V.	70VDC	7.5VDC	68.5VDC	9VDC
5	117Z3	117VAC	0V.	0V.	117VAC	117VAC	115VDC	0V.

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	*	6KΩ	16KΩ	220KΩ	*	4.5 Meg.	*
2	1U4	*	6KΩ	16KΩ	1 Meg.	*	10 Meg.	*
3	1S5	*	0Ω	1.1 Meg.	3.3 Meg.	1 Meg.	10 Meg.	*
4	3S4	*	6KΩ	2.5 Meg.	6KΩ	*	6KΩ	*
5	117Z3	500Ω	INF.	0Ω	460Ω	500Ω	2KΩ	0Ω

VOLTAGE AND RESISTANCE READINGS TAKEN IN AC-DC POSITION.

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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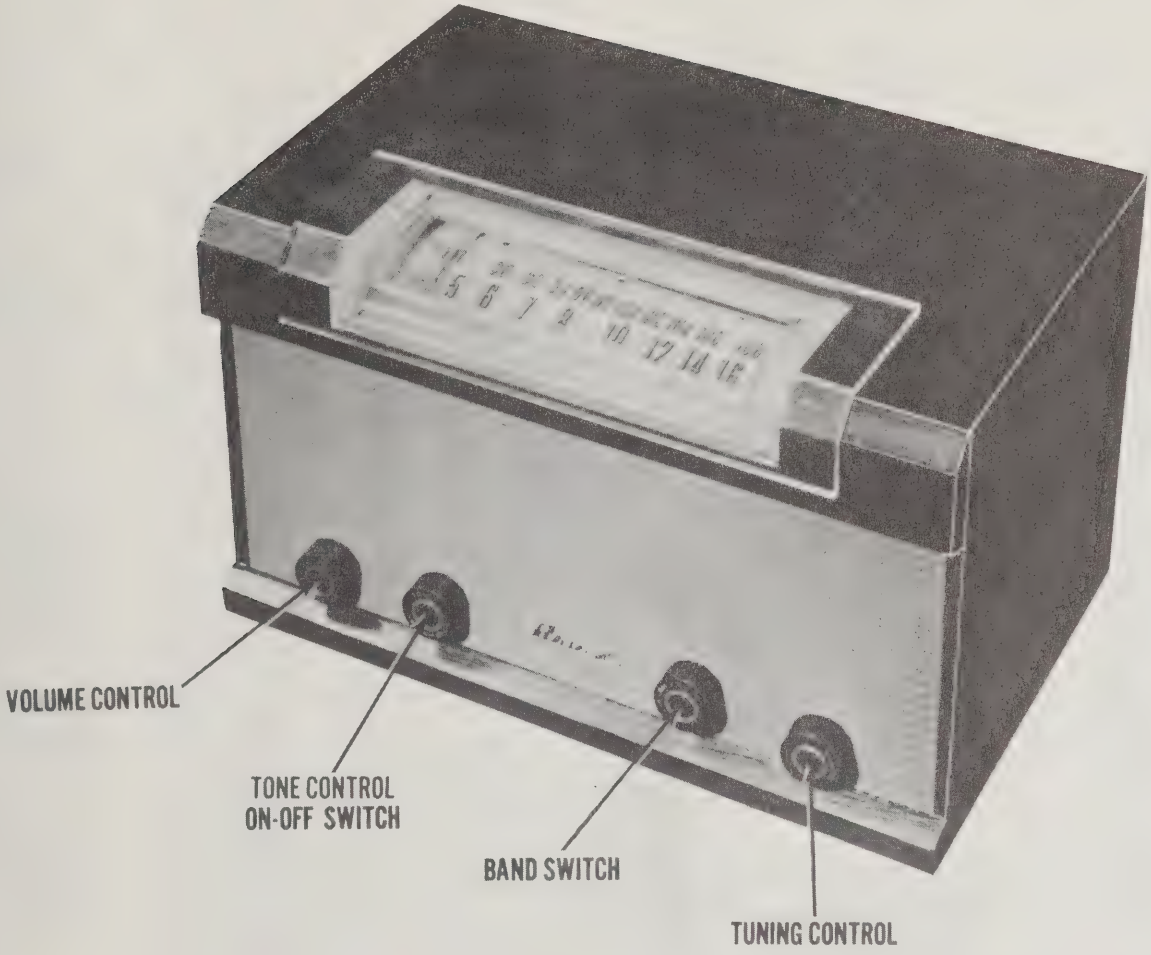
4814-1

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by shorting AVC to B-.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volts.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

ARVIN MODEL 280TFM,
281TFM (Ch. RE-253)



ARVIN MODEL 280TFM,
281TFM (Ch. RE-253)

ARVIN MODEL 280TFM

TRADE NAME	Arvin, Models 280TFM, 281TFM (Ch. RE-253)
MANUFACTURER	Noblitt-Sparks Industries, Columbus, Ind.
TYPE SET	AC-DC Operated AM-FM Superheterodyne Receiver with Loop Antenna
TUBES (EIGHT)	Types, 6C4 FM 1st RF Amp., 12BA6 FM 2nd RF Amp., 12BE6 Converter, 12BA6 1st IF Amp., 12BA6 FM 2nd IF Amp., 6AQ6 Det.-AVC-AF, 12H6 FM Det.-AVC, 50L6GT Power Output.
POWER SUPPLY	110-120 Volts AC-DC
RATING	.38 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540-1600KC FREQ. MOD. 88-108MC

HOWARD W. SAMS & CO., INC. • **Indianapolis Indiana**

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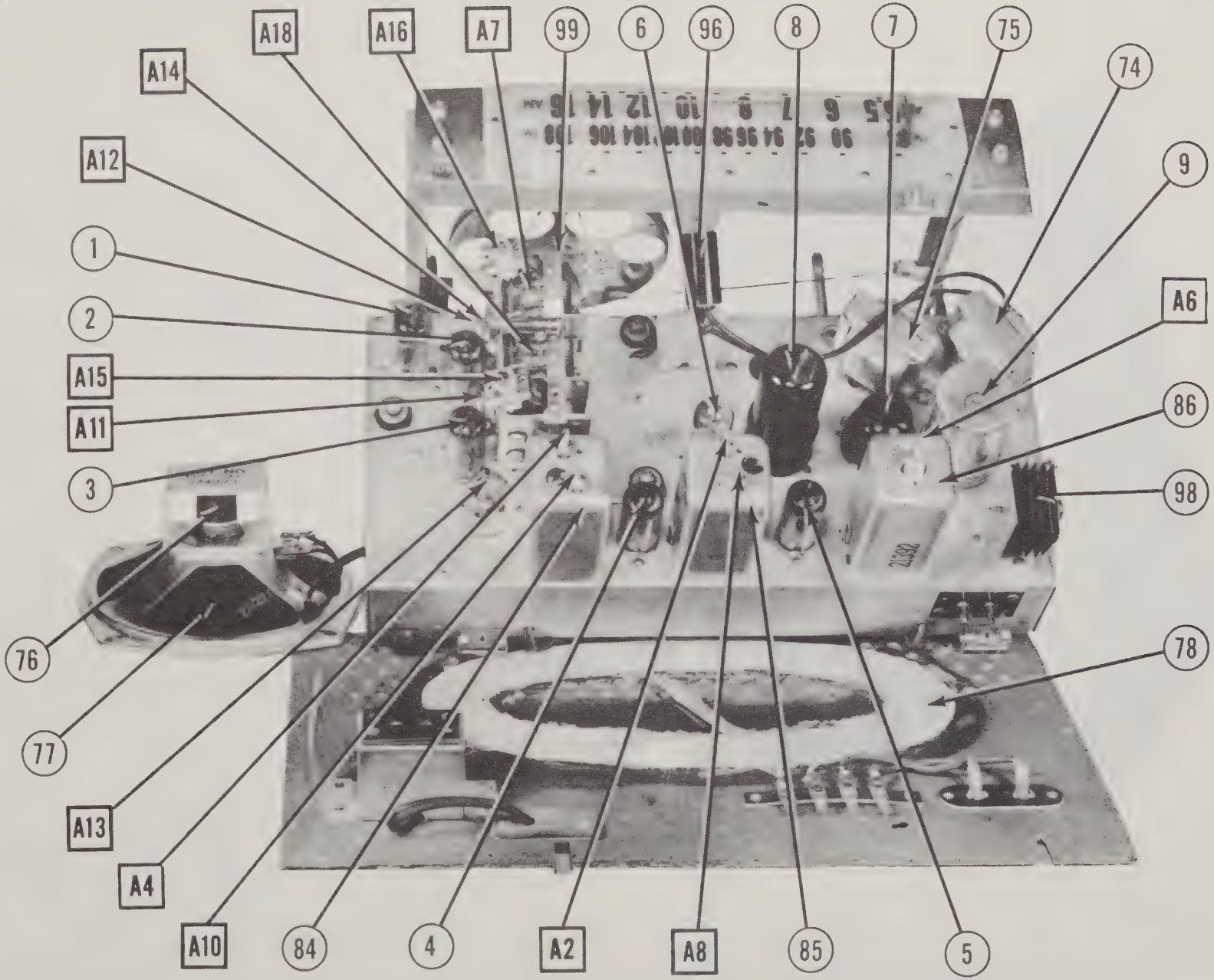

A18
A16
A7
99
6
96
8
7
75
74
A14
A12
9
1
2
A6
A15
A11
86
3
98
76
78
77
A13
A4
A10
84
4
A2
A8
85
5

A1
A3
A5
A7
A9
A
B
C

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	FM 1st RF Amp.	6C4	6C4	6BG	
2	FM 2nd RF Amp.	12BA6	12BA6	7BK	
3	Converter	12BE6	12BE6	7CH	
4	1st IF Amp.	12BA6	12BA6	7BK	
5	FM 2nd IF Amp.	12BA6	12BA6	7BK	
6	Det.-AVC-AF	6AQ6	6AQ6	7BT	
7	FM Det.-AVC	12H6	12H6	7Q	
8	Power Output	50L6GT	50L6GT	7AC	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: SOLAR PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
9A	40	150	A21402	AF886D4A#	UP443150#	DY-419#	EL-443*	▲ Filter
B	40	150		PR8150/50	BR5015	M-40-150	TA-440#	▲ "
C	80	150						■ "
D	20	25						Cathode Bypass
10	8	50	A21403	PR850/10	BR105	M-10-50	TA-510	Stabilizing Cap.
11	.05	400	C20249-503	484-05	DT4S5	ST-4-05	TC-15	Line Filter
12	.005	600	C20248-502	684-005	DT6D5	ST-6-005	TC-25	Output Plate Bypass
13	.005	200	C20250-502	484-005	DT6D5	ST-6-005	TC-25	Tone Comp.
14	.05	400	C20250-502	484-05	DT4S5	ST-4-05	TC-15	Audio Coupling
15	.01	600	C20249-103	684-01	DT6S1	ST-6-01	TC-11	" "
16	.05	200	C20250-503	484-05	DT2S5	ST-4-05	TC-15	AVC Filter
17	100	500	C20204-101	1468-0001	5W5T1	MO.5-31	1FM-31	Line Ant. Coupling-Cer.
18	250	500	C20065-251	1468-00025	5W5T25	MO.5-325	1FM-325	Output Grid Bypass
19	1000	350	C20226-102	1468-001	1W5D1	MW.5-21	1FM-21	RF Bypass Pwr. Supply-Cer
20	2000	350	C20203-202	1467-002	1W5D2	MW.5-22	1FM-22	De-emphasis-Cer.
21	50	500	C20205-5	1469-00005	5R5Q5	MOS.5-45	MS-45	Diode Load Cap.-Note 1 *
22	50	500	C20205-5	1469-00005	5R5Q5	MOS.5-45	MS-45	" " " " " " *
23	5000	350	C20226-502	1467-005	1D5D5	MW.5-25	1FM-25	2nd IF Decoupling *
24	5000	350	C20226-502	1467-005	1D5D5	MW.5-25	1FM-25	2nd IF Cathode Bypass *
25	100	500	C20204-101	1468-0001	5W5T1	MO.5-31	1FM-31	Diode RF Filter *
26	100	500	C20204-101	1468-0001	5W5T1	MO.5-31	1FM-31	" " " *
27	5000	350	C20226-502	1467-005	1D5D5	MW.5-25	1FM-25	1st IF Decoupling *
28	5000	350	C20226-502	1467-005	1D5D5	MW.5-25	1FM-25	AVC Filter *
29	5000	350	C20226-502	1467-005	1D5D5	MW.5-25	1FM-25	Converter Decoupling *
30	1000	350	C20226-102	1468-001	1W5D1	MW.5-21	1FM-21	Converter Bypass *
31	20	500	C20205-3		5W5Q2	MOS.5-42	MS-42	Conv. Plate Bypass *
32	27	500	C20204-270	1468-000025	5W5Q25	MO.5-425	MS-425	Osc. Grid Cap. *
33	100	500	C20205-2	1469-0001	5R5T1	MOS.5-31	MS-31	Fixed Padder *
34	200	500	C20206-201	1469-0002	5R5T2	MOS.5-32	MS-32	" " *
35	10	500	C20204-100	1468-00001	5W5Q1	MO.5-41	MS-41	RF Coupling-Cer.
36	5000	350	C20226-502	1467-005	1D5D5	MW.5-25	1FM-25	RF Bypass Pwr. Supply-Cer.
37	1000	350	C20226-102	1468-001	1W5D1	MW.5-21	1FM-21	RF Decoupling-Cer.
38	50	500	C20204-500	1468-00005	5W5Q5	MO.5-45	1FM-45	RF Cathode -Cer.
39	500	350	C20226-501	1468-0005	5W5T5	MO.5-35	1FM-35	RF Coupling-Cer.
40	500	350	C20226-501	1468-0005	5W5T5	MO.5-35	1FM-35	Cathode Follower Decoup."
41	1000	350	C20226-102	1468-001	1W5D1	MW.5-21	1FM-21	AVC Filter-Cer.
42	10	500	C20204-100	1468-00001	5W5Q1	MO.5-41	MS-41	FM Ant. Coupling-Cer.
43	10	500	C20204-100	1468-00001	5W5Q1	MO.5-41	MS-41	FM Ant. Coupling-Cer.
44	100	500	C20204-101	1469-0001	5R5T1	MOS.5-31	MS-31	RF Bypass
45	50	500	C20204-500	1468-00005	5W5Q5	MO.5-45	1FM-45	Filament Bypass-Note 2-Cer
46	50	500	C20204-500	1468-00005	5W5Q5	MO.5-45	1FM-45	" " "
47	50	500	C20204-500	1468-00005	5W5Q5	MO.5-45	1FM-45	" " "
48	1000	350	C20226-102	1468-001	1W5D1	MW.5-21	1FM-21	" " "

*Omit 30MMFD section.
#Parallel sections to obtain desired capacity.
Note 1-When either Item 21 or 22 are replaced, replace both with capacitors of equal value
Note 2-Not used in all models.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	INSTALLATION NOTES
	FIELD	VC IMP.		ST-107*		*Use adaptor baffle.
76	PM	3.4Ω	C21331	Mod. P5-V	52A1	
	CONE DIA.	VC DIA.				
77	5-1/8"	1/2"				

R F COILS

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: MEISSNER PART No.
78	Loop Ant.		1Ω	AE21395-1	
79	Ant. Coupling Coil	.5Ω	.5Ω	AA21398-1	
80	FM 1st RF Coil		0Ω	AC21399-1	
81	FM 2nd RF Coil		0Ω	AC21400-1	
82	BC Osc.Coil	.7Ω	6Ω	AC21396-1	14-1060
83	FM " "		0Ω	AC21397-1	
84A	AM 1st IF	18.4Ω	18.4Ω	AC21390-1	
B	FM " "	17.6Ω	.8Ω		
85A	AM 2nd IF	17.2Ω	17.2Ω	AD21391-1	
B	FM " "	1Ω	1Ω		
86	FM Det.Trans	1Ω	1Ω	AD21392-1	
87	RF Choke		1.5Ω	AA21445-1	
88	" "		1.5Ω	AA21445-1	
89	" "		1.5Ω	AA21445-1	
90	" "		1.5Ω	AA21445-1	
91	" "		1.5Ω	AA21445-1	
92	" "		1.5Ω	AA21445-1	
93	Line Filter Choke		.2Ω	AA21444-1	
94	"		.2Ω	AA21444-1	
95	Suppressor Choke		0Ω	A21709	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA	INSTALLATION NOTES
96	Screw	120			A19135		Type C-7

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
97	Switch	C21406	Band
98	Rectifier	A20207-3	Selenium 150MA
99	Tuning Gang	AC21401-1	(35-310MMF, 25-200MMF)
A12	Trimmer	A21439	FM Osc. Adj.
A15	"	A21440	" RF "
A16	"	A21440	" Ant. "
	Cabinet	R21379	280TFM
	"	R21379-2	281TFM
	Dial Scale	D21389	
	Dial Pointer	AC21377-1	

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	
49A	1 Meg.	½	C21404-1	D13-137	AM-63-Z	Volume Control
B	Shaft		Not Req.	E	KSS-3	Attach to 49A per instructions
50A	500KΩ	½	C21405-1	D13-133	AM-60-Z	Tone Control
B	Shaft		Not Req.	E	KSS-3	Attach to 50A per instructions
C	Switch		" "	41	SW-A	" " " " "

RESISTORS

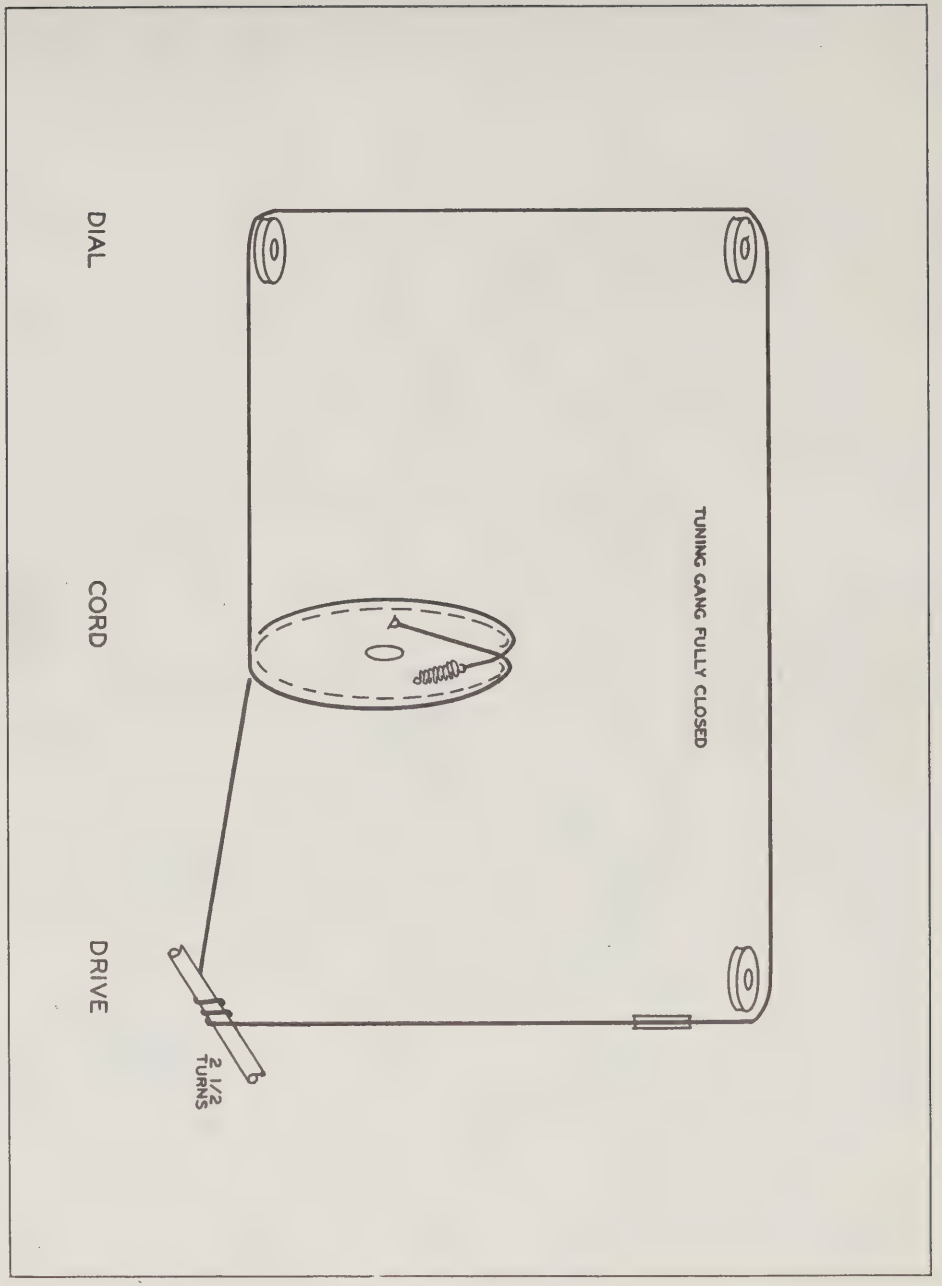
ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	ARVIN PART No.	IRC PART No.	
51	100Ω	½	C20060-102	BTS-1000	Br.-Blk.-Red Cathode Follower Decoup.
52	1 Meg.	½	C20060-105	BTS-1 Meg.	Br.-Blk.-Grn. RF Grid
53	68Ω	½	C20060-680		Blue-Gray-Blk. RF Cathode
54	330Ω	½	C20060-331		Or.-Or.-Br. RF Decoup.
55	22KΩ	½	C20060-223	BTS-22K	Red-Red-Or. AM Osc. Grid
56	330Ω	½	C20060-331		Or.-Or.-Br. Conv Decoup.
57	100KΩ	½	C20060-104	BTS-100K	Br.-Blk.-Yl. AVC Network
58	68Ω	½	C20060-680		Blue-Gray-Blk. IF Cathode
59	1000Ω	½	C20060-102	BTS-1000	Br.-Blk.-Red IF Decoup.
60	22KΩ	½	C20060-223	BTS-22K	Red-Red-Or. Diode Filter
61	68Ω	½	C20060-680		Blue-Gray-Blk. 2nd IF Cathode
62	1000Ω	½	C20060-102	BTS-1000	Br.-Blk.-Red 2nd IF Decoup.
63	100Ω	½	C20060-101		Br.-Blk.-Br. RF Filter
64	6800Ω	½	C20120-682	BTS-6800	Blue-Gray-Red Ratio Det. Diode Load
65	6800Ω	½	C20120-682	BTS-6800	Blue-Gray-Red " " " "
66	22KΩ	½	C20060-223	BTS-22K	Red-Red-Or. De-emphasis
67	1 Meg.	½	C20060-105	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
68	2.2 Meg.	½	C20060-225	BTS-2.2 Meg.	Red-Red-Grn. " "
69	6.8 Meg.	½	C20060-685	BTS-6.8 Meg.	Blue-Gray-Grn. AF Grid
70	330KΩ	½	C20060-334	BTS-330K	Or.-Or.-Yl. AF Plate Load
71	220Ω	½	C20060-221	BW-½-220	Red-Red-Br. Output Cathode
72	100Ω	1	C20103-101	BW-1-100	Br.-Blk.-Br. Filter
73	22Ω	½	C20060-220	BW-½-22	Red-Red-Blk. Surge Limiter

FILTER CHOKE

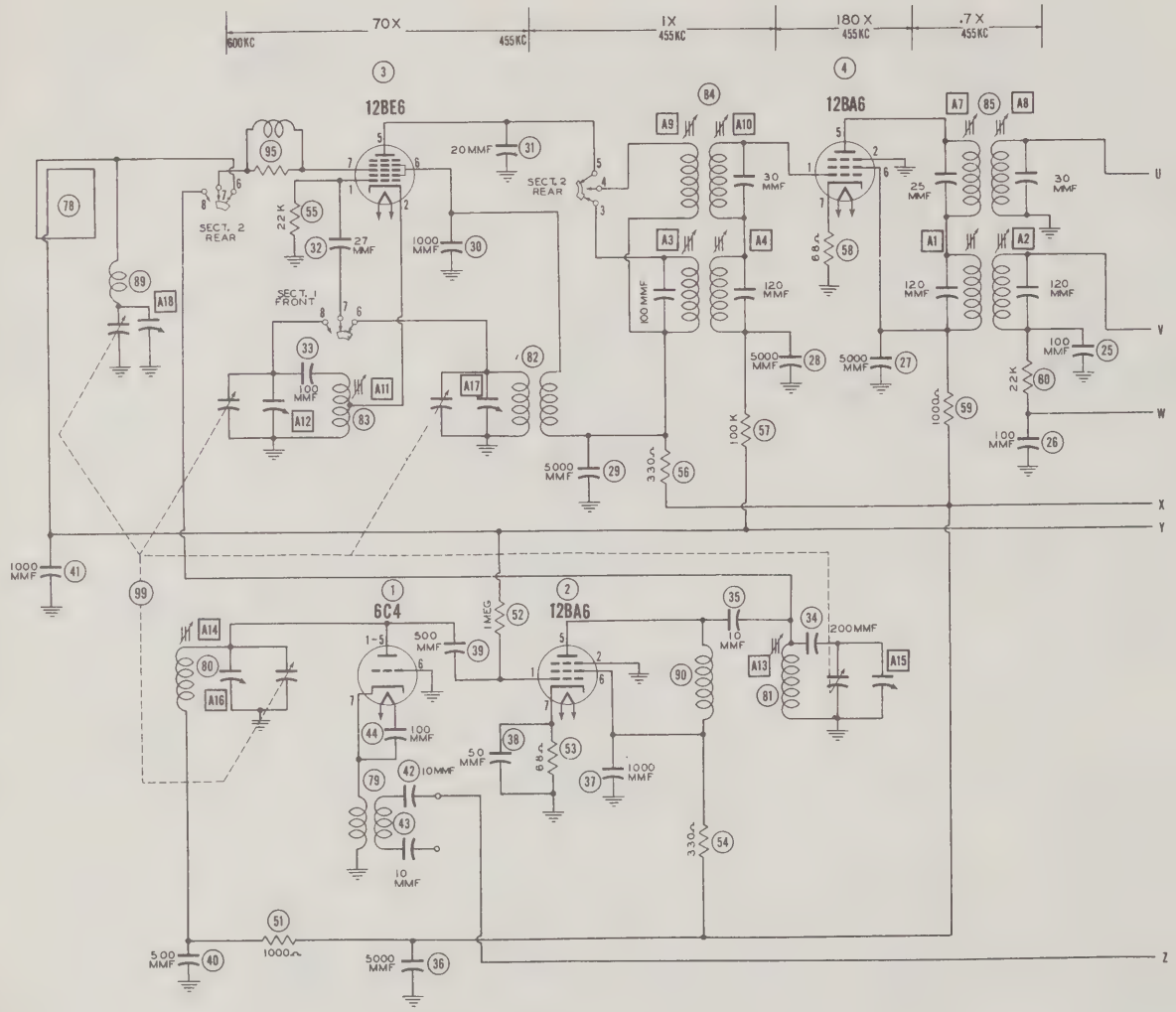
ITEM NO.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT 1000	ARVIN PART NO.	STANCOR PART NO.	THORDARSON PART NO.	MERIT PART No.	
74	.06A	220Ω	7 Henries	AC-21394-1	C-1706	T-20C52	C-2975	

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		ARVIN PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
75	2200Ω	3.4Ω	108Ω	.3Ω	AC-21393-1	A-3876	T22845	A-2928	



DATE 8/48-#4814-2 SET #44-FOLDER #2



VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6C4	7.5VDC	0V.	45VAC	40VAC	6.5VAC	0V.	0V.	-
‡ 2	12BA6	0V.	0V.	40VAC	30VAC	100VDC	100VDC	1VDC	-
3A	12BE6	-3.4VDC§	0V.	45VAC	55VAC	100VDC	100VDC	-.25VDC	-
‡ 3B	12BE6	-1.2VDC§	0V.	45VAC	55VAC	100VDC	100VDC	0V.	-
4	12BA6	0V.	0V.	55VAC	70VAC	90VDC	90VDC	.8VDC	-
‡ 5	12BA6	0V.	0V.	30VAC	18VAC	90VDC	90VDC	.9VDC	-
6	6AQ6	-.4VDC	0V.	0V.	6VAC	-.3VDC	0V.	40VDC	-
‡ 7	12H6	0V.	18VAC	-.3VDC	0V.	0V.	130VDC	6VAC	.3VDC
8	50L6GT	0V.	70VAC	115VDC	105VDC	0V.	0V.	117VAC	9VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

BANDSWITCH SHOWN IN BROADCAST POSITION.

IF=455KC
AM

IF=10.7MC
FM

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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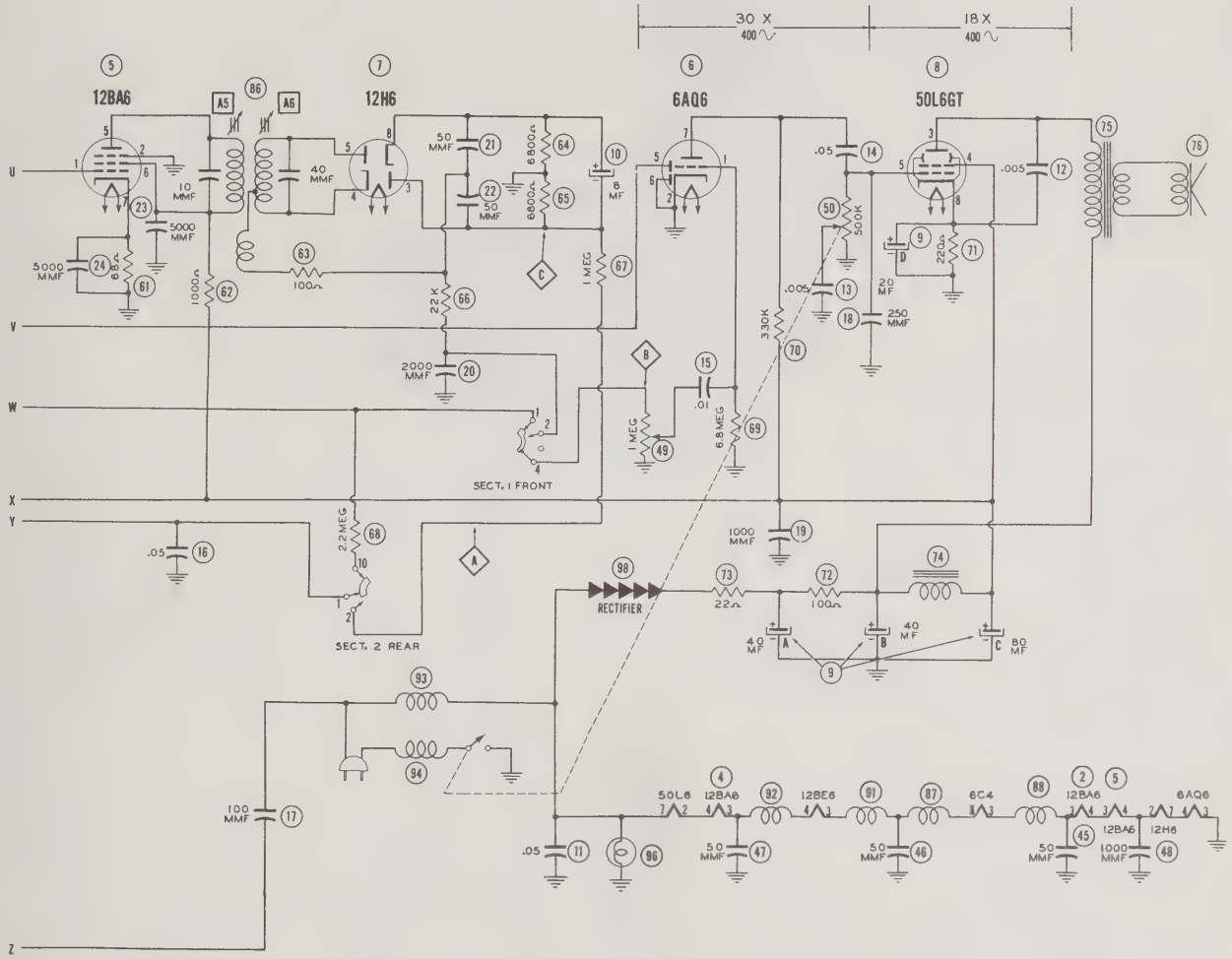

VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6C4	21KΩ	0Ω	40Ω	38Ω	21KΩ	0Ω	.8Ω	-
‡ 2	12BA6	2 Meg.	0Ω	36Ω	28Ω	20KΩ	20KΩ	92	-
3A	12BE6	22KΩ	0Ω	42Ω	52Ω	20KΩ	20KΩ	3.3 Meg.	-
‡ 3B	12BE6	22KΩ	0Ω	42Ω	52Ω	20KΩ	20KΩ	0Ω	-
4	12BA6	3.3 Meg.	0Ω	50Ω	60Ω	21KΩ	21KΩ	68Ω	-
‡ 5	12BA6	1Ω	0Ω	26Ω	20Ω	<1KΩ	.1K	68Ω	-
6	6AQ6	6.8 Meg.	0Ω	0Ω	8Ω	1 Meg.	0Ω	3.6KΩ	-
‡ 7	12H6	0Ω	20Ω	.2KΩ	1 Meg.	1 Meg.	.2K	0Ω	6.2K
8	50L6GT	INF.	5KΩ	.2KΩ	2KΩ	5.6KΩ	1 Meg.	90Ω	220Ω

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial.

Use isolation transformer if available. If not, connect a .1 MFD capacitor in series with low side of signal generator and chassis.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.05 MFD.	High side to Pin 7 (grid) 12BE6. Low side to chassis.	455KC	AM (left)	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output If isolation transformer is not used reduce dummy ant. to .001 MFD. to reduce hum modulation.

FM ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
2	Direct	High side to Pin 1 (grid) 12BA6 2nd IF Tube (5). Low side to chassis.	10.7MC (unmodulated)	FM (right)	Tuning cap. fully open.	DC probe to Point A Common lead to chassis.	A5	Adjust for maximum deflection.
3	"	"	"	"	"	DC probe to Point B Common lead to chassis.	A6	Use a zero center scale meter if available. Adjust for zero deflection.
4	"	High side to Pin 7 (grid) 12BE6. Low side to chassis.	"	"	"	DC probe to Point A Common lead to chassis.	A7,A8, A9,A10	Adjust for maximum deflection.
5	220Ω carbon res.	High side to unbypassed FM ant. terminal. Low side to bypassed ant. terminal. Disconnect green lead to ant. terminal strip.	88MC	"	88MC	"	A11	Adjust for maximum deflection.
6	"	"	108MC	"	108MC	"	A12	Adjust for maximum deflection. Repeat Steps 5 & 6 until no further improvement can be made.
7	"	"	91MC	"	Tune for maximum deflection.	"	A13, A14	Adjust for maximum deflection.
8	"	"	105MC	"	"	"	A15, A16	Adjust for maximum deflection. Repeat Steps 7 & 8 until no further improvement can be made. Continue with Step 9.

FM ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

In Steps 2 & 3 disconnect parasitic suppressor (coil wound on resistor - Item 94) from Pin 7 of 12BE6. Solder a 100KΩ resistor from Pin 7 of 12BE6 to chassis keeping leads as short as possible.

Signal should be freq. modulated 450KC sweep with 60∿ modulation. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
2	.05 MFD	See scope pre-alignment notes. High side to Pin 7 (grid) 12BE6. Low side to chassis.	10.7MC (freq. mod.)	FM (right)	Tuning cap. fully open.	Vertical input to Point C Ground to chassis.	A5,A8, A7,A10 A9.	Disconnect 8 MFD cap. from Point C Adjust for maximum height, symmetry and coincidence per Pattern A.
3	"	"	"	"	"	Vertical input to Point B Ground to chassis.	A6	Reconnect 8 MFD cap. to Point C Adjust for maximum straightness of crossover lines with crossover occurring at center of Pattern B. Reconnect coil (94) to pin 7 & disconnect 100KΩ resistor.
4	220Ω carbon res.	Disconnect green lead from ant. terminal strip. High side to unbypassed terminal of ant. terminal strip. Low side to bypassed terminal.	88MC	"	88MC	Vertical input to Point C Ground to chassis.	A11	Disconnect 8 MFD cap. from Point C Adjust All for coincidence of Pattern A.
5	"	"	108MC	"	108MC	"	A12	Adjust for coincidence of Pattern A. Repeat Steps 4 & 5 until no further improvement can be made.
6	"	"	91MC	"	Tune for coincidence.	"	A13, A14	Adjust for maximum amplitude of Pattern A.
7	"	"	105MC	"	"	"	A15, A16	Adjust for maximum amplitude of Pattern A. Repeat Steps 6 & 7 until no further improvement can be made. Reconnect 8 MFD cap. to Point C and continue with Step 9.

AM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
9		Loop	1620KC	AM (left)	Tuning cap. fully open.	Across voice coil	A17	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum ouptut.
10		"	1400KC	"	Tune for maximum output.	"	A18	Adjust for maximum output. Check tracking at 1000KC and 600KC.

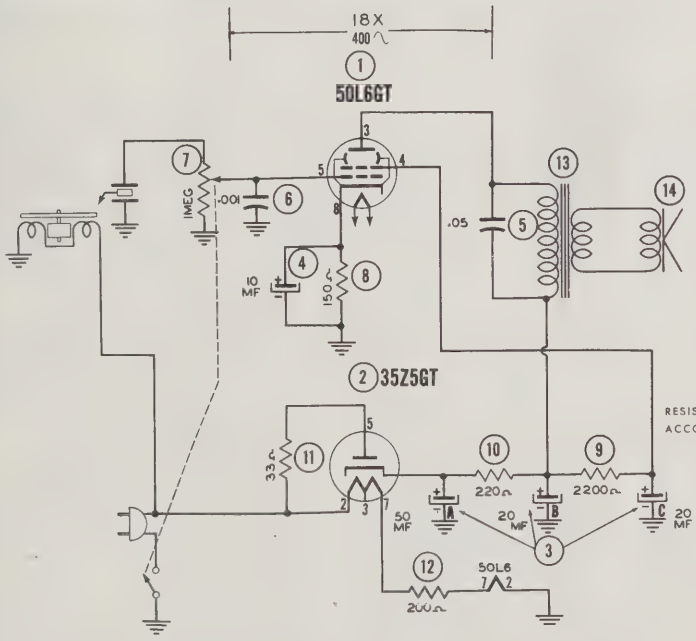
PATTERN A

PATTERN B

AUDAR MODEL
P-7

AUDAR MODEL P-7

TRADE NAME	Audar, Model P-7
MANUFACTURER	Audar Inc., Argos, Indiana
TYPE SET	AC Operated Phono Player with 2 Tube Amplifier
TUBES (TWO)	Types, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	110-120 Volts AC RATING .23 Amp. @ 117 Volts AC



VOLTAGE AND RESISTANCE READINGS

Pin No.	50L6GT Volt.	50L6GT Res.	35Z5GT Volt.	35Z5GT Res.
1	0V.	0Ω	0V.	INF.
2	0V.	0Ω	117VDC	275Ω
3	113VDC	100KΩ	111VAC	27Ω
4	113VDC	100KΩ	120VDC	100KΩ
5	0V.	0Ω	115VAC	30Ω
6	0V.	INF.	0V.	0Ω
7	52VAC	50Ω	82VDC	240Ω
8	7VDC	150Ω	130VDC	100KΩ

VOLUME CONTROL AT MINIMUM.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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4814-3

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at minimum, no signal applied for voltage measurements.

HOWARD W. SAMS & CO., INC. **Indianapolis Indiana**

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AUDAR PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Power Output	50L6GT	50L6GT	7AC	
2	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AUDAR PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
3A	30	150		AF844D	EZ43215	DSB-403020-150	EL-224	Filter-Red
B	20	150						" -Yl.
C	20	150						" -Yl.
4	10	25		PRS25-10	BR102A	M-10-25	TA-10	Cathode Bypass
5	.05	400		484-05	DT4S2	ST-4-05	TC-15	Output Plate Bypass
6	.001	600		684-001	DT6D1	ST-6-001	TC-21	Tone Compensation

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AUDAR PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
7A	1 Meg.	½	VCP-10105	D18-137	AM-63-Z	Volume Control
B	Shaft		Not Reg.	E	KSS-3	Attach to 7A per instructions
C	Switch		" "	41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AUDAR PART No.	IRC PART No.	IDENTIFICATION CODES
8	150Ω	1		BW-1-150	Br.-Grn.-Br. Output Cathode
9	2200Ω	1		BTA-2200	Red-Red-Red Filter
10	220Ω	1		BW-1-220	Red-Red-Br. "
11	33Ω	½		BW-½-33	Or.-Or.-Blk. Rectifier Ballast
12	200Ω	10		AB-200	Line Dropping

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: AUDAR PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	INSTALLATION NOTES
13	1750Ω	3.0Ω	170Ω	.6Ω	Part of SP10001	A-3876*	T22S45*	A-2928*	Bend mounting tabs down, file out slots and mount on original brackets.

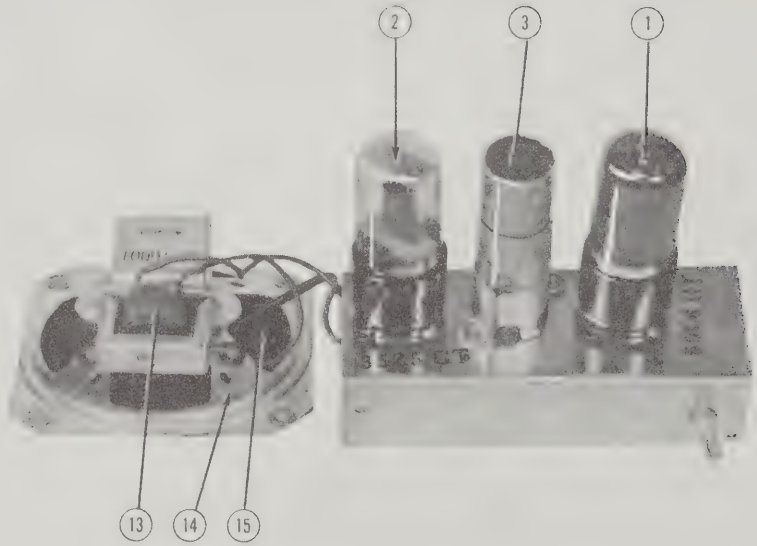
SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: AUDAR PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
14	FIELD	VC IMP.	SP-10001	ST-113#	4A07#	#Enlarge cut out
	PM	3.0Ω		Mod. P4-X		
15	CONE DIA.	VC DIA.				
	4"	1/2"				

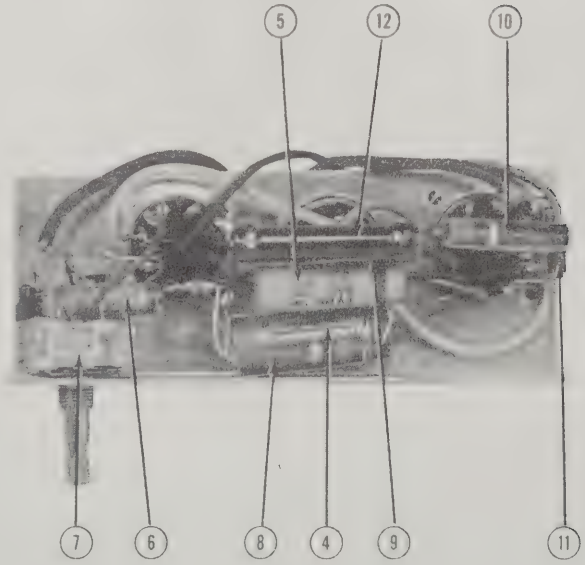
DISASSEMBLY INSTRUCTIONS

1. Loosen set screw and remove control knob.
2. Remove lock nut holding shaft through player mounting board.
3. Remove two wood screws holding cover board over back of speaker. Remove board from cabinet.
4. Remove four wood screws holding record player mounting board in cabinet. Lift up mounting board to gain access to chassis.
5. Remove four wood screws holding speaker mounting board in cabinet.
6. Unsolder phono-pickup and phono-motor leads from chassis.
7. Remove one wood screw holding chassis in cabinet. Remove chassis and speaker from cabinet.

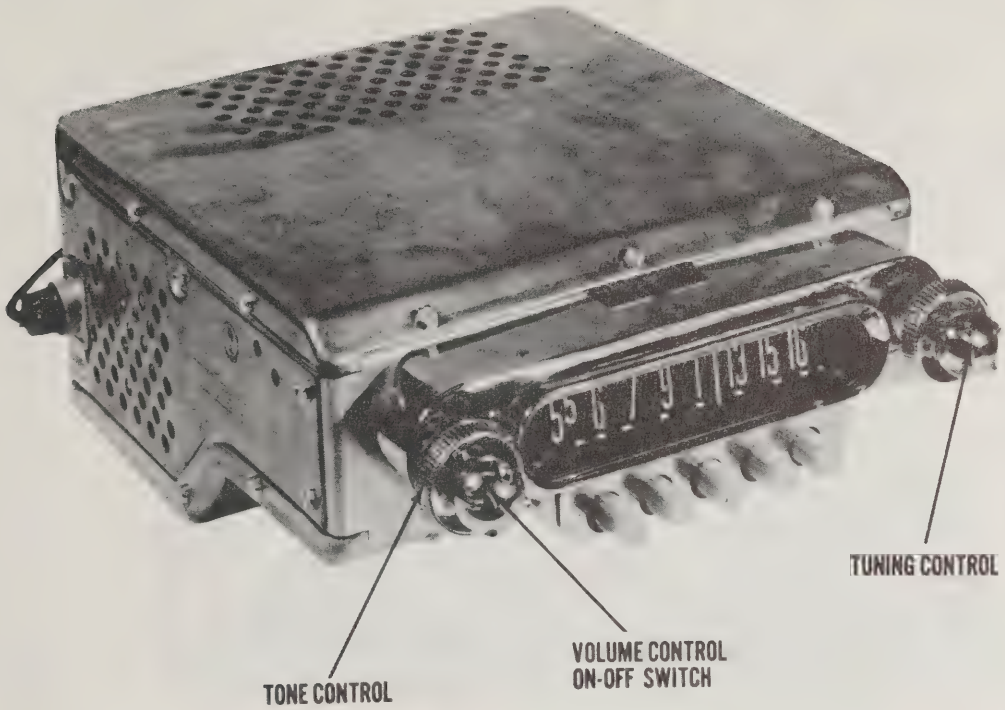
CHASSIS—TOP VIEW



CHASSIS—BOTTOM VIEW



FORD MODEL
8072 (8A-18805-A)



FORD MODEL
8072 (8A-18805-A)

FORD MODEL 8072

TRADE NAME	Ford, Model 8072 (8A-18805-A)
SUPPLIER	Ford Motor Car. Co., Detroit, Mich.
TYPE SET	Battery Operated Custom Built Automotive Superheterodyne Receiver
TUBES (SIX)	Types, 6SK7GT RF Amp., 6SA7GT Converter, 6SK7GT IF Amp., 6SQ7GT Det.-AVC-AF, 6V6GT Power Output, 6X5GT Rectifier.
POWER SUPPLY	6 Volt Storage Battery
TUNING RANGE—BROADCAST	535-1610KC RATING 6.2 Amp. @ 7.2 Volts DC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to Pin 8 (grid) of 6SA7 tube. Low side to chassis.	265KC	Tuning cores fully out.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
2	2-30MMFD caps.	Shunt one 30MMFD cap. across ant. socket. High side of sig. gen. in series with the other 30MMFD cap. to ant. socket. Low side to chassis.	1610KC	"	"	A5,A6, A7	" " " "
3	"	"	1400KC	Set core carriage 5/16" from the setting of the last step.	"	A8,A9, A10	Adjust for maximum output. Repeat Steps 2 and 3 until no further improvement can be made. Check calibration at 1000 and 600KC. Check to see if receiver will tune through 540KC. Seal all core adjustment with cement to prevent slippage.

PUSHBUTTON ADJUSTMENTS

1. Turn receiver on and allow to warm up for at least 15 minutes.
2. Make up a list of 5 stations to be set up.
3. Loosen pushbutton knobs by turning knobs about 1/2 turn counterclockwise.
4. Manually tune in 1st station desired to be set up and depress any button completely.
5. Holding manual control tighten knob firmly.
6. To check accuracy of setting with station tuned in by the pushbutton attempt to tune in station more accurately with manual tuning control. If setting is off slightly, repeat Steps 3 to 6.
7. To set up remaining buttons follow procedure outlined above.

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PARTS LIST AND DESCRIPTIONS

FORD MODEL 8072

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: DETROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.		6SK7GT	8N	
2	Converter		6SA7GT	8AD	
3	IF Amp.		6SK7GT	8N	
4	Det.-AVC-AF		6SQ7GT	8Q	
5	Power Output		6V6GT	7AC	
6	Rectifier		6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DETROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	10	350		AF32K4A	UP2235C	DY310	EL-153	▲ Filter
B	15	350						■ "
C	20	25						Cathode Bypass
8	.008	1600		14689-.008		STM-16-.008	TR28	Buffer
9	.5	120			DT2P5	SHH-1		Hash Filter
10	.5	120			DT2P5	SHH-1		" "
11	.005	600		684-.005	DT6D5	ST-6-.005	TC25	Output Plate Bypass
12	.005	600		684-.005	DT6D5	ST-6-.005	TC25	Tone Compensation
13	.05	400		484-.005	DT4S5	ST-4-.05	TC15	Audio Coupling
14	.005	600		684-.005	DT6D5	ST-6-.005	TC25	" "
15	.01	400		484-.01	DT4S1	ST-4-.01	TC11	Tone Compensation
16	.1	200		484-.1	DT2P1	ST-2-1	TC1	Screen Bypass
17	.01	400		484-.01	DT4S1	ST-4-.01	TC11	Cathode Bypass IF
18	.05	200		484-.05	DT2S5	ST-4-05	TC15	AVC Filter
19	.01	400		484-.01	DT4S1	ST-4-01	TC11	RF Coupling
20	220	500		1468-.00025	5W5T25	MO.5-32	1FM-32	AF Plate Bypass
21	150	300		1469-.00015	5W5T15	MOS.5-315	1FM-315	Tone Comp.
22	180	300						Fixed Trimmer
23	100	500		1468-.0001	5W5T1	MO.5-31	1FM-31	Osc. Grid Cap.
24	330	500						Fixed Trimmer
25	470	500						Fixed Padder
26	100	500		1468-.0001	5W5T1	MO.5-31	1FM-31	RF Coupling
27	330	500						Fixed Padder
28	150	500		1468-.00015	5R5T15	MO.5-315	1FM-315	Fixed Trimmer
69A	250	300		1468-.00025	5W5T25	MO.5-325	1FM-325	Hash Filter
B	250	300		1468-.00025	5W5T25	MO.5-325	1FM-325	" "

CONTROLS

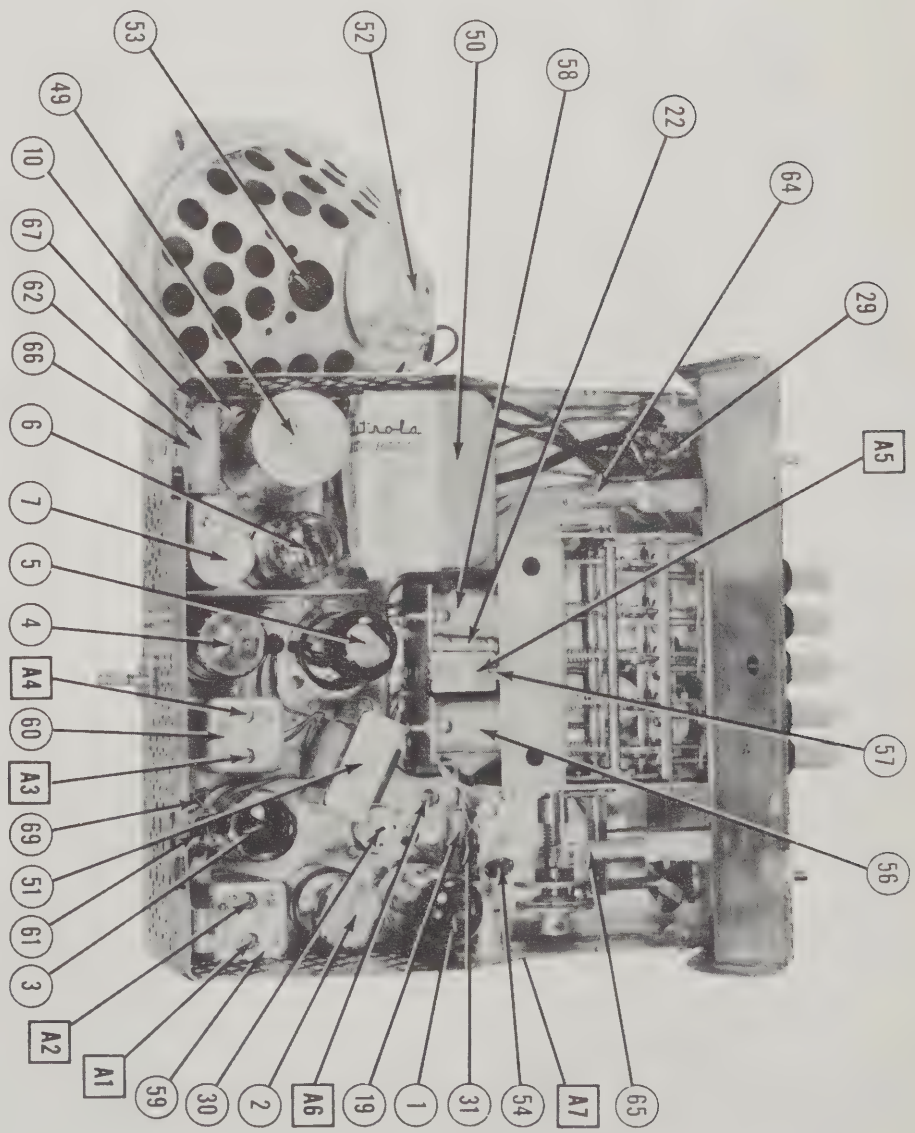
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DETROLA PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
29A	500KΩ	½	B-71013-1			Volume Control & Switch tapped @ 150KΩ
B	1 Meg.	½				Tone Control-See Note
30	100 to 2000Ω	1				Sensitivity Control

Note-This is a dual unit, operated by concentric shaft.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DETROLA PART No.	IRC PART No.	IDENTIFICATION CODES
31	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. RF Grid
32	10KΩ	1		BTA-10K	Br.-Blk.-Or. RF Plate Load
33	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. Conv. Grid
34	6.8 Meg.	½		BTS-6.8 Meg.	Blue-Gray-Grn. " "
35	22KΩ	½		BTS-22K	Red-Red-Or. Series Sensitivity Control
36	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Osc. Grid
37	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
38	22KΩ	½		BTS-22K	Red-Red-Or. Tone Compensation
39	15 Meg.	½		BTS-15 Meg.	Br.-Grn.-Blue AF Grid
40	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. AF Plate
41	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
42	270Ω	1		BW-1-270	Red-Vi.-Br. Output Cathode
43	18KΩ	2		BT-2-18K	Br.-Gray-Or. Voltage Dropping
44	2700Ω	2		BT-2-2700	Red-Vi.-Red Filter
45	.27Ω	1			Red-Vi.-Silver Filament Dropping

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	DETROLA PART No.	IRC PART No.	
46	.47Ω	½		BW-½-.47	Yl.-Vi.-Silver Rect. Filament Dropping
47	10KΩ	½		BTS-10K	Br.-Blk.-Or. Hash Suppressor-See Note
48	150Ω	1		BW-1-150	Br.-Grn.-Br. " "

Note-Not used in all models.

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA		INSTALLATION NOTES
				DETROLA PART No.	RADIART PART No.	
49	Interrupter	6.8 VDC	115 ∿	B70347	5301	

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	DETROLA PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
50	6.8V DC @ 2.7A.	540V CT 052A DC			EC-71014			

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		DETROLA PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
51	5600Ω	2.9Ω	560Ω	.5Ω	C-71012-C	A-3877	T22S46	A-2930	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			DETROLA PART No.	JENSEN PART No.	QUAM PART No.	
52	FIELD PM	VC IMP. 2.9Ω	D-71060-1		69A15	
53	CONE DIA. 6"x9"	VC DIA. 3/4"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA	
		PRI.	SEC.	DETROLA PART No.	MEISSNER PART No.
54	Ant. Loading Coil		.1Ω		
55	Ant. Coil		11.8Ω		
56	Wave Trap		26.3Ω		
57	RF Coil		5.2Ω		
58	Osc. Coil	.2Ω	11.6Ω		
59	Input IF	62Ω	62Ω		
60	Output IF	52Ω			
61	RF Choke		.1Ω		
62	Hash Choke		0Ω		
63	Vibrator Choke		0Ω		

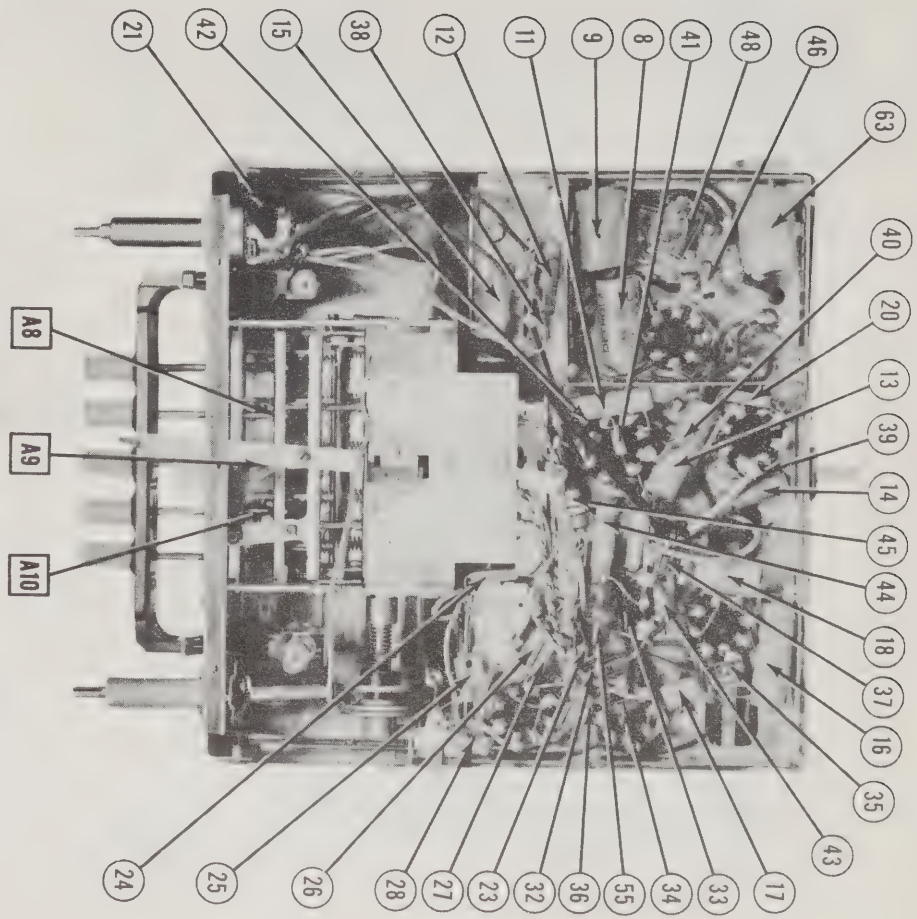
DIAL LIGHT

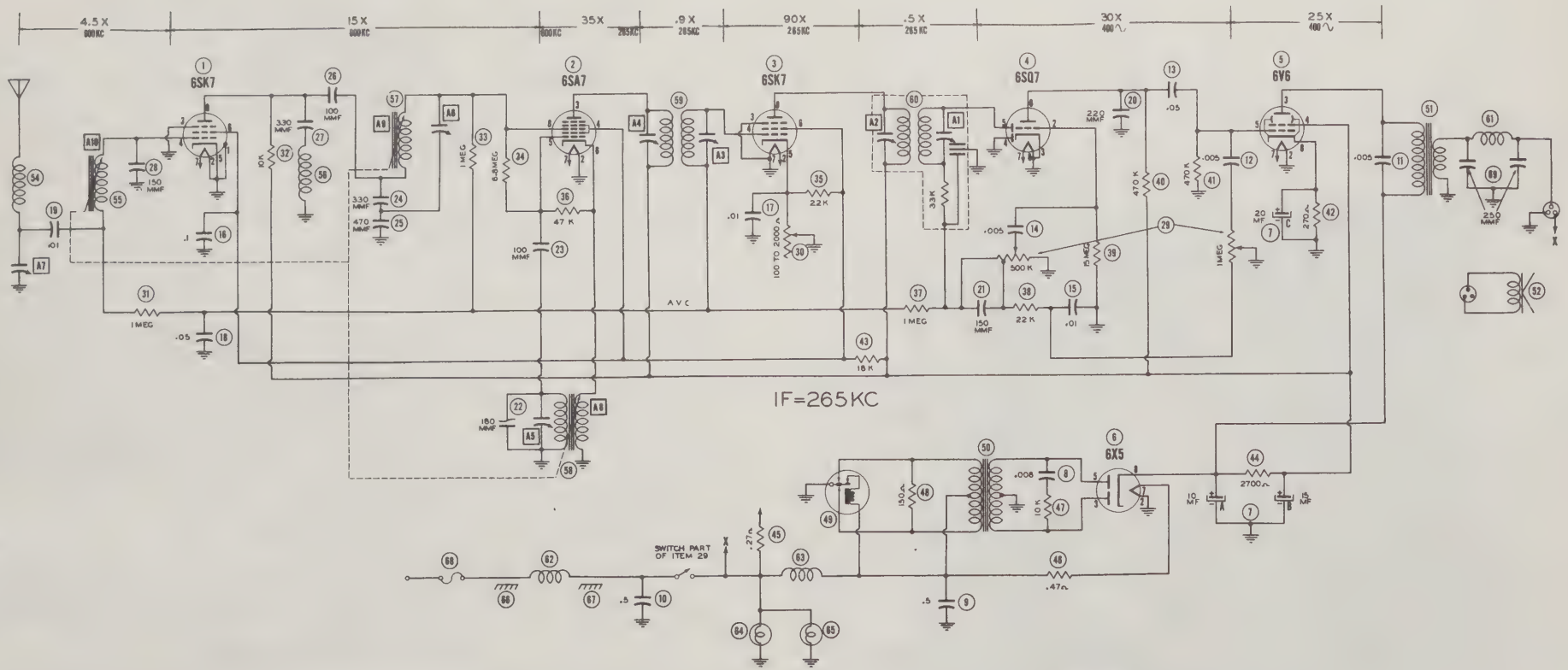
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					DETROLA PART No.		
64	Bayonet	6-8	0.25	Blue			Type 44
65	"	6-8	0.25	"			" "

MISCELLANEOUS

ITEM No.	PART NAME	DETROLA PART No.	NOTES
66	Spark Plate		
67	" "		
68	Fuse		9 Amp.

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SK7GT	0V.	6.3VDC	0V.	-.4VDC	0V.	55VDC	0V.	135VDC
2	6SA7GT	0V.	0V.	195VDC	55VDC	-5.2VDC§	0V.	6.3VDC	-.2VDC
3	6SK7GT	0V.	6.3VDC	0V.	-.2VDC	38VDC	55VDC	0V.	105VDC
4	6SQ7GT	0V.	-.8VDC	0V.	0V.	-.6VDC	85VDC	6.3VDC	0V.
5	6V6GT	0V.	0V.	230VDC	195VDC	0V.	250VDC	6.3VDC	10VDC
6	6X5GT	0V.	0V.	270VAC	0V.	270VAC	0V.	6.3VDC	250VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SK7GT	0Ω	.1Ω	0Ω	2.5 Meg.	0Ω	24KΩ	0Ω	50KΩ
2	6SA7GT	0Ω	0Ω	40KΩ	24KΩ	47KΩ	.2Ω	.1Ω	2 Meg.
3	6SK7GT	0Ω	.1Ω	0Ω	1.5 Meg.	2KΩ	24KΩ	0Ω	40KΩ
4	6SQ7GT	0Ω	15 Meg.	0Ω	0Ω	530KΩ	510KΩ	.1Ω	0Ω
5	6V6GT	0Ω	0Ω	40KΩ	43KΩ	470KΩ	40KΩ	.1Ω	270Ω
6	6X5GT	INF.	0Ω	350Ω	INF.	375Ω	INF.	.1Ω	40KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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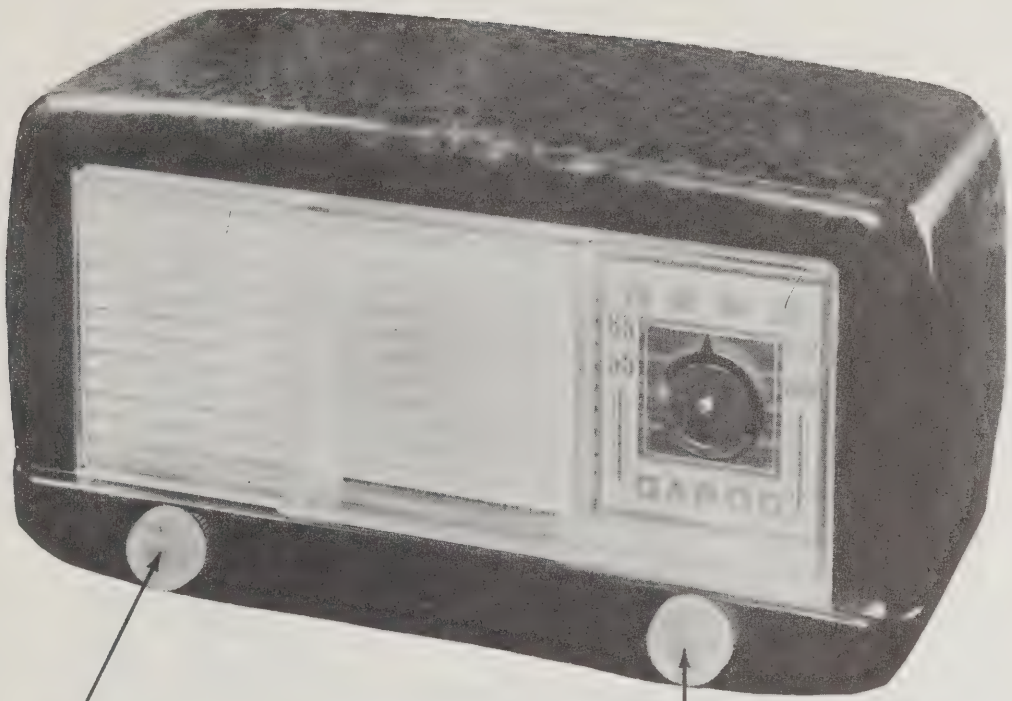
4814-4

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by connecting negative (-) 3 volts to the AVC line.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

GAROD MODEL
5A3



GAROD MODEL
5A3

GAROD MODEL 5A3

TRADE NAME	Garod, Model 5A3
MANUFACTURER	Garod Radio Corp., 70 Washington St., Brooklyn 1, N.Y.
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types, 12BE6 Converter, 12BA6 IF Amp., 12AT6 Det.-AVC-AF, 50B5 Power Output, 35W4 Rectifier.
POWER SUPPLY	105-125 Volts AC-DC
TUNING RANGE—BROADCAST	540-1650KC RATING .23 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.
Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.05 MFD.	High side to rear stator of tuning cap. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2		Loop	1650KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1500KC	Tune for maximum output.	"	A6	Adjust for maximum output.

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DATE 8/48-#4814-5 SET #44-FOLDER #5

PARTS LIST AND DESCRIPTIONS

GAROD MODEL 5A3

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: GAROD PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12BE6	12BE6	7CH	
2	IF Amp.	12BA6	12BA6	7BK	
3	Det.-AVC-AF	12AT6	12AT6	7BT	
4	Power Output	50B5	50B5	7BZ	
5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: GAROD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	40	150	5.415	PRSA150/40-40	BRD4415	DSB-2x40-150	TA-440	Filter-Red
B	40	150		M-20-150	BR2015	M-20-150	UT-201	" -Blue
C	20	150						" -Green
7	.05	400		484-.05	DT4S5	ST-4-05	TC-15	Line Filter
8	.2	400		484-.2	DT4P2	ST-4-2	72P3	Line Isolation
9	.02	400		484-.02	DT4S2	ST-4-02	TC-12	Output Plate Bypass
10	.01	400		484-.01	DT4S1	ST-4-01	TC-11	Audio Coupling
11	.01	400		484-.01	DT4S1	ST-4-01	TC-11	" "
12	.01	400		484-.01	DT4S1	ST-4-01	TC-11	IF Coupling
13	.005	600		684-.005	DT6D5	ST-6-005	TC-25	Ext. Ant. Isolation
14	.02	200		484-.02	DT2S2	ST-4-02	TC-12	AVC Bypass
15	220	300		146-.0002	5W5T2	MO.5-32	1FM-32	Audio Plate Bypass-Cer.
16	220	300		1468-.0002	5W5T2	MO.5-32	1FM-32	Diode RF Filter-Cer.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: GAROD PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
17A	1 Meg.	½	8.201-4	D13-137	AM-63-Z	Volume Control
B	Shaft		Not Req.	E	KSS-3	Attach to 17A per instructions
C	Switch		" "	41	SW-A	" " " " "

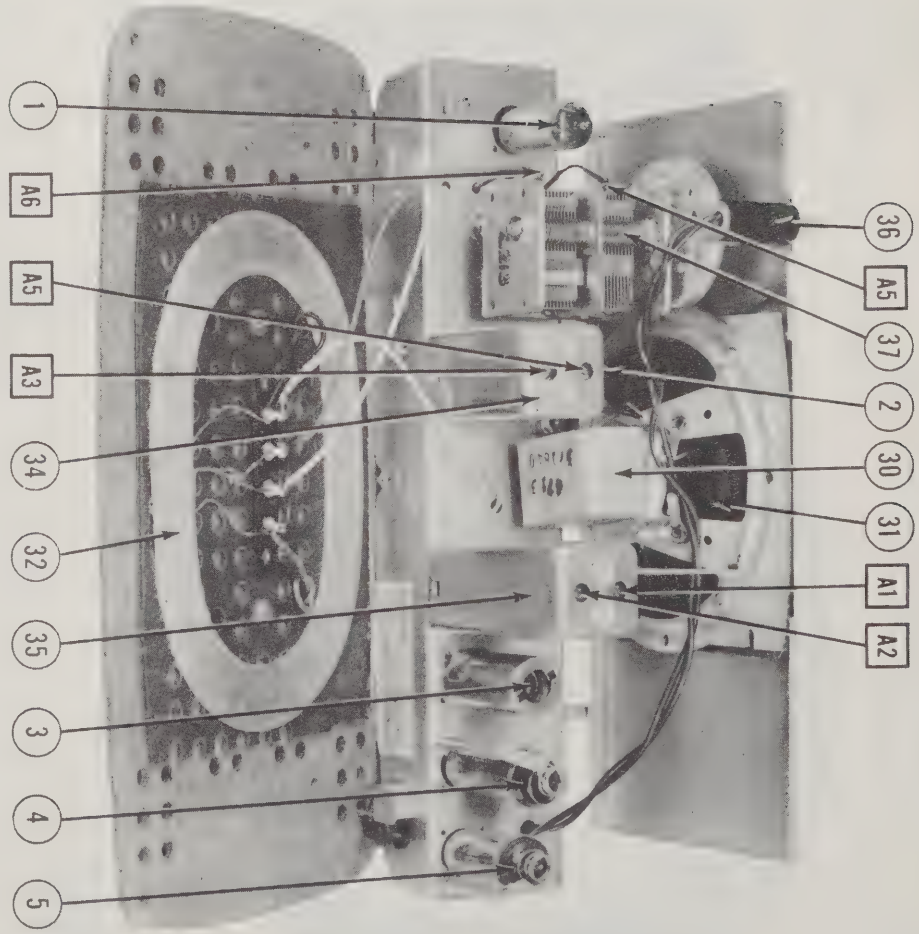
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: GAROD PART No.	IRC PART No.	IDENTIFICATION CODES
18	22KΩ	½		BTS-22K	Red-Red-Or. Osc. Grid
19	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. IF Grid
20	150Ω	½		BW-½-150	Br.-Grn.-Br. IF Cathode
21	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
22	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Diode Filter
23	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue AF Grid
24	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. AF Plate Load
25	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
26	150Ω	½		BW-½-150	Br.-Grn.-Br. Output Cathode
27	1000Ω	1		BTA-1000	Br.-Blk.-Red Filter
28	100Ω	½		BW-½-100	Br.-blk.-Br. "

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: GAROD PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.	INSTALLATION NOTES
29	1650Ω	3.1Ω	150Ω	.45Ω	9.200	A-3876‡	T22S45‡	A-2928‡	‡Bend mounting tabs down, file out slots and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			GAROD PART No.	JENSEN PART No.	QUAM PART No.	
30	FIELD PM	VC IMP. 3.1Ω	30.300	ST-107 Mod. P5-V	5A07	
31	CONE DIA. 4½"	VC DIA. 1"				

R F COILS

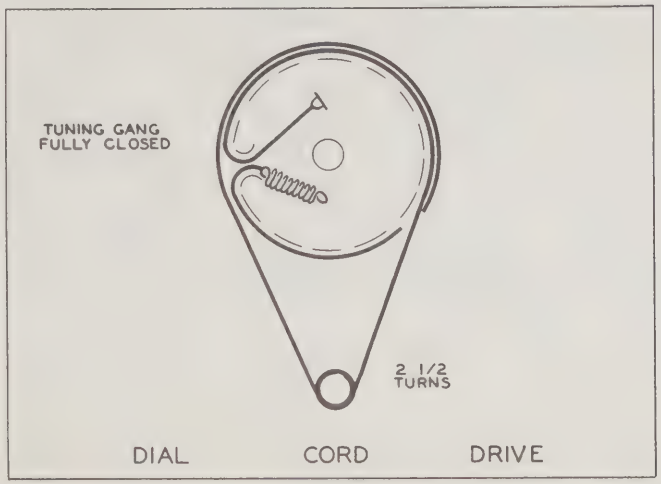
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	GAROD PART No.	MEISSNER PART No.	
32	Loop Ant.	.2Ω	1.2Ω	1.464		
33	Osc. Coil	.5Ω	6.8Ω	1.402	14-1060	
34	Input IF	43Ω	42Ω	1.259	16-6658	
35	Output IF	42Ω	42Ω	1.409	16-6660	

DIAL LIGHT

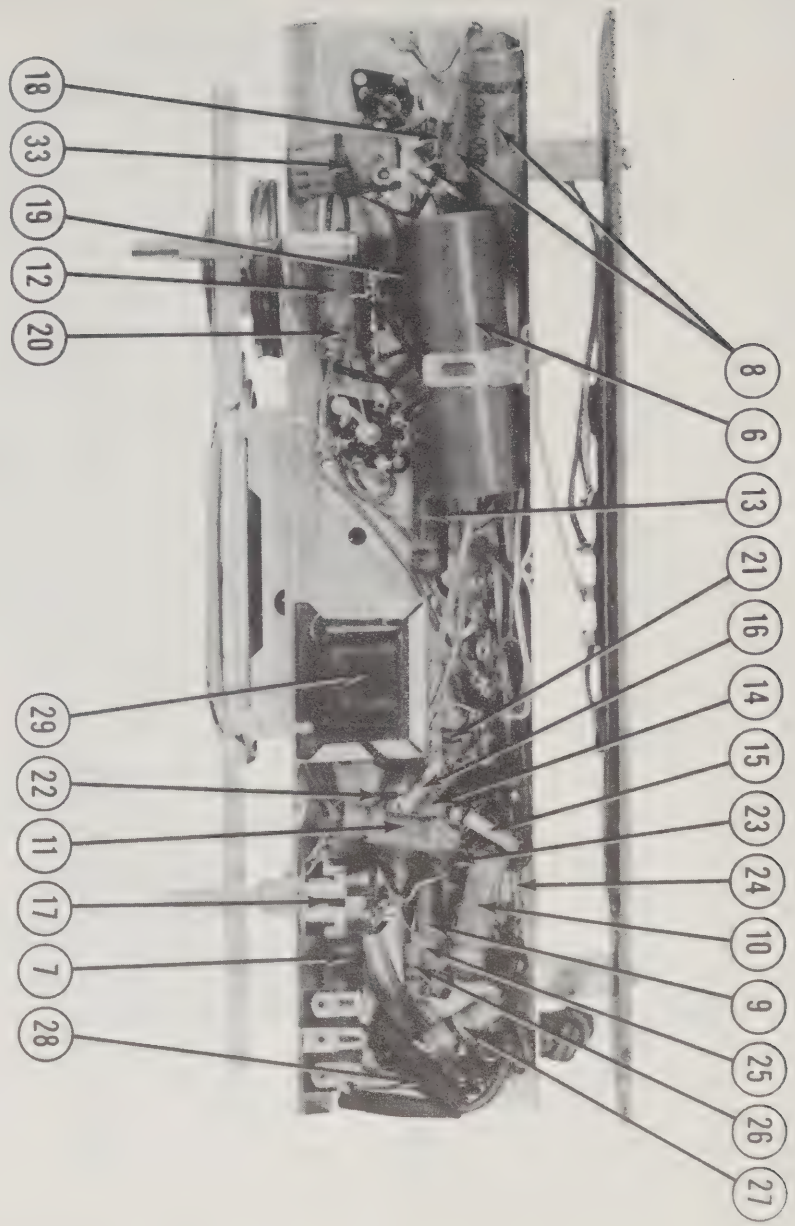
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					GAROD PART No.		
36	Bayonet	6-8	0.15	Brown			Type 47

MISCELLANEOUS

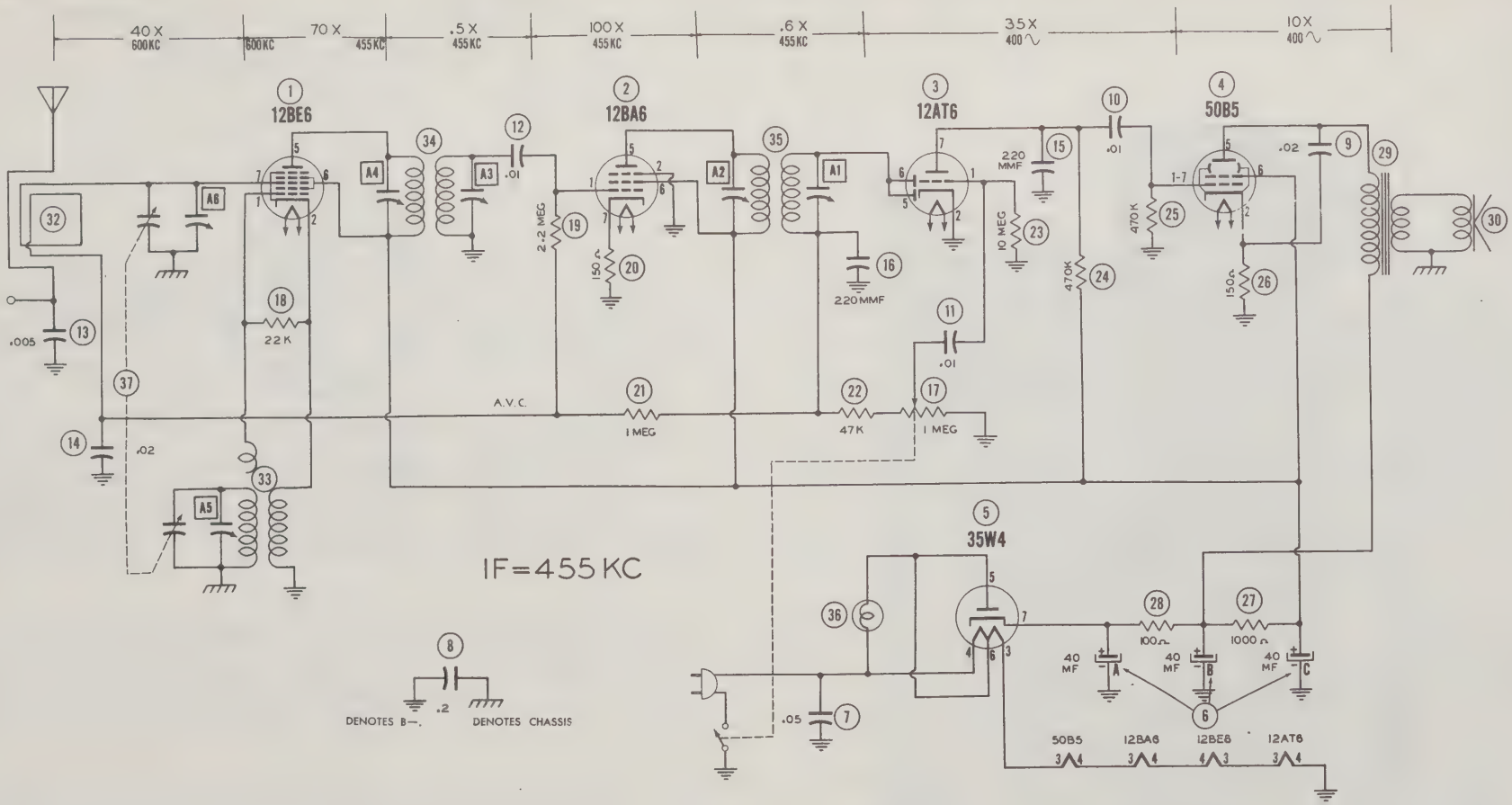
ITEM No.	PART NAME	GAROD PART No.	NOTES
37	2 Gang Var. Cap	2.213	(13-355MMF, 25-188MMF)



CHASSIS—BOTTOM VIEW



GAROD MODEL 5A3



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	12BE6	-11.1VDC§	0V.	13VAC	26VAC	95VDC	95VDC	-3.4VDC
2	12BA6	0V.	0V.	40VAC	26VAC	95VDC	95VDC	.8VDC
3	12AT6	-.8VDC	0V.	13VAC	0V.	-.6VDC	-.6VDC	55VDC
4	50B5	0V.	6.6VDC	90VAC	40VAC	115VDC	95VDC	0V.
5	35W4	120VDC	120VDC	90VAC	117VAC	115VAC	115VAC	125VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	12BE6	22KΩ	.5Ω	14Ω	26Ω	90KΩ	90KΩ	2 Meg.
2	12BA6	4.2 Meg.	0Ω	38Ω	26Ω	90KΩ	90KΩ	150Ω
3	12AT6	10 Meg.	0Ω	14Ω	0Ω	1 Meg.	1 Meg.	560KΩ
4	50B5	470KΩ	150Ω	90Ω	38Ω	90KΩ	90KΩ	470KΩ
5	35W4	90KΩ	90KΩ	90Ω	120Ω	110Ω	110Ω	90KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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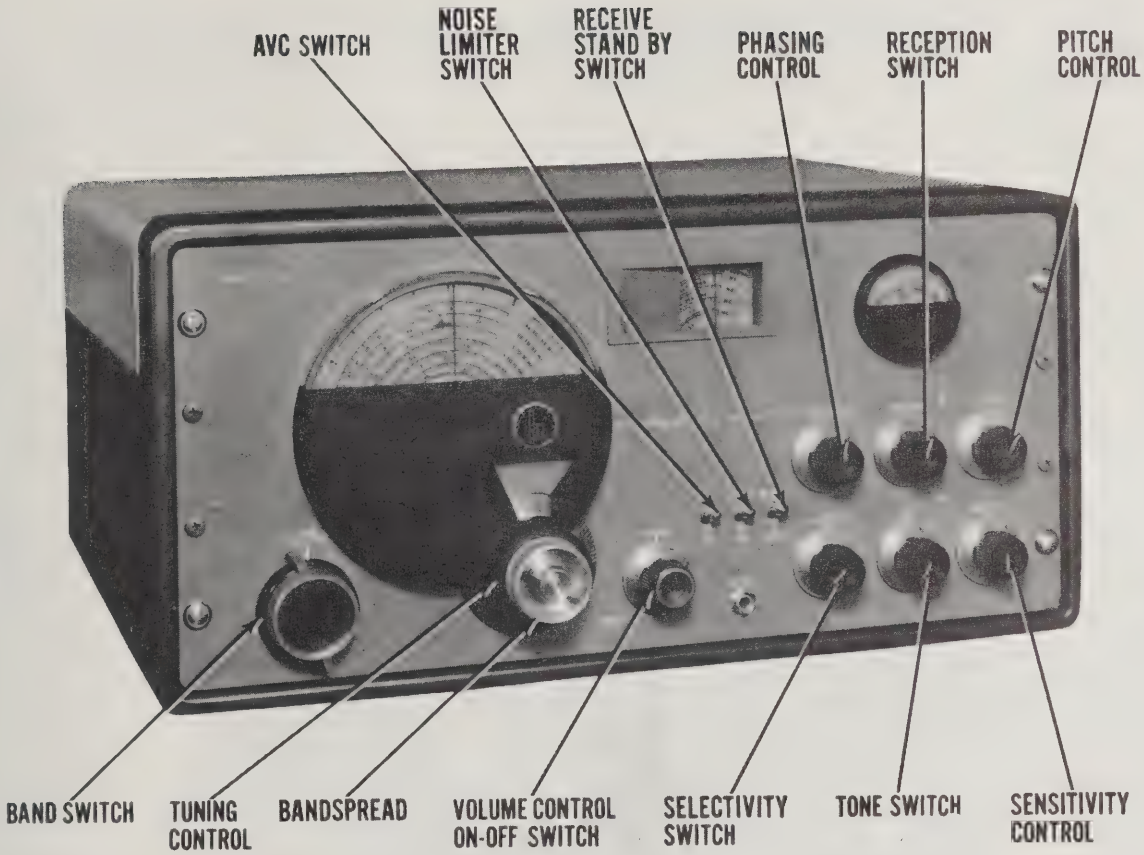
4814-5

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



HALLICRAFTERS MODEL
SX-42

HALLICRAFTERS MODEL
SX-42

HALLICRAFTERS MODEL SX-42

TRADE NAME	Hallicrafters, Model SX-42		
MANUFACTURER	Hallicrafters Co., 5th & Kostner Avenues, Chicago 24, Ill.		
TYPE SET	AC Operated Multi-Band Commercial Type Superheterodyne Receiver		
TUBES (FIFTEEN)	Types, 6AG5 1st RF, 6AG5 2nd RF, 7F8 Converter, 6SK7 1st IF Amp., 6SG7 2nd IF Amp., 6H6 AM Det.-Noise Limiter, 7H7 1st Limiter, 7H7 2nd Limiter, 6H6 Discriminator, 7A4 BFO-S Meter Amp., 6SL7GT Audio Inverter, (2) 6V6GT Power Output, 5U4G Rectifier, OD3/VR150 Voltage Reg.		
POWER SUPPLY	105-125 Volts AC-DC	RATING	1.07 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540-1620KC	SHORT WAVE	1.62-5MC, 5-15MC, 15-30MC, 27-55MC, 55-110MC
		FM	27-55MC, 55-110MC

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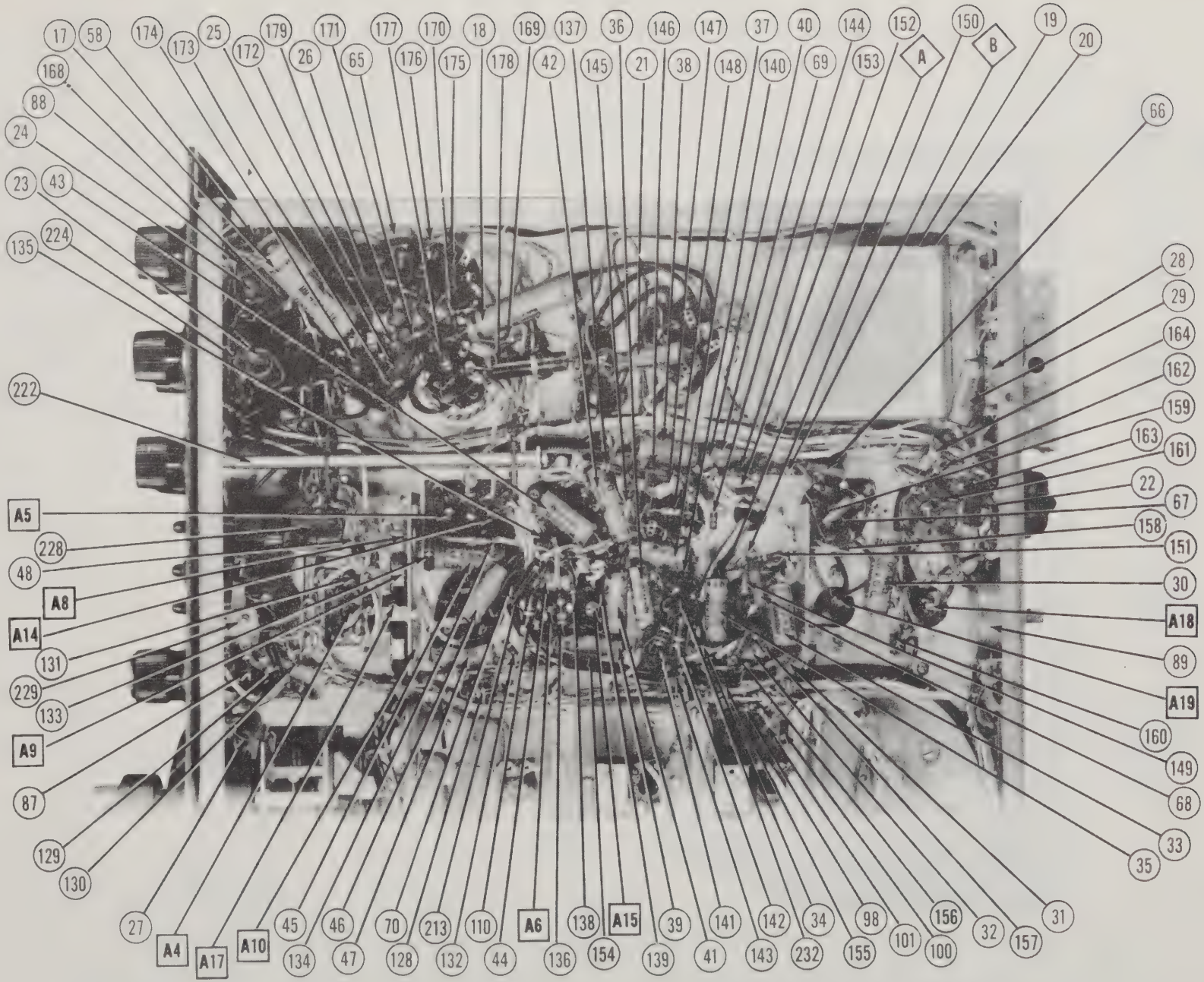
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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: HALLICRAFTER PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	1st RF	6AG5	6AG5	7BD	
2	2nd RF	6AG5	6AG5	7BD	
3	Converter	7F8	7F8	8BW	
4	1st IF Amp.	6SK7	6SK7	8N	
5	2nd IF Amp.	6SG7	6SG7	8BK	
6	AM Det.-Noise Limiter	6H6	6H6	7Q	
7	1st Limiter	7H7	7H7	8V	
8	2nd Limiter	7H7	7H7	8V	
9	Discriminator	6H6	6H6	7Q	
10	BFO-S Meter Amp	7A4	7A4	5AC	
11	Audio Inverter	6SL7GT	6SL7GT	8BD	
12	Power Output	6V6GT	6V6GT	7AC	
13	" "	6V6GT	6V6GT	7AC	
14	Rectifier	5U4G	5U4G	5T	
15	Voltage Reg.	OD3/VR150	OD3/VR150	4AJ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: HALLICRAFTERS PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: SOLAR PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
16A	30	450	45A041		UP4445C	DY-313	EL-330	▲ Filter
B	20	450						■▲ "
C	20	25						■ Cathode Bypass
17	100	25	45A116	PRS25-100	BRH251	M-100-25	UHC-102	Sens. Control Bypass
18	10	25	45A064	PRS25-10	BR102A	M-10-25	TA-10	Cathode Bypass
19	.01	600	46AG103J	684-01	DT6S1	MPH-6-01	TC-11	Line Filter
20	.01	600	46AG103J	684-01	DT6S1	MPH-6-01	TC-11	" "
21	.01	600	46AY103J	684-01	DT6S1	ST-6-01	TC-11	RF Bypass Pwr. Supply
22	.01	600	46AG103J	684-01	DT6S1	ST-6-01	TC-11	Switch Bypass
23	.05	600	46AY503J	684-05	DT6S5	ST-6-05	TC-15	Tone Compensation
24	.05	600	46AY503J	684-05	DT6S5	ST-6-05	TC-15	" "
25	.02	400	46AW203J	484-02	DT4S2	ST-4-02	TC-12	Audio Coupling
26	.02	400	46AW203J	484-02	DT4S2	ST-4-02	TC-12	" "
27	.01	400	46AW103J	484-01	DT4S1	ST-4-01	TC-11	" "
28	.02	400	46AW203J	484-02	DT4S2	ST-4-02	TC-12	BFO Grid Filter
29	.02	400	46AW203J	484-02	DT4S2	ST-4-02	TC-12	" " "
30	.05	400	46AW503J	484-05	DT4S5	ST-4-05	TC-15	Decoupling
31	.01	400	46AW103J	484-01	DT4S1	ST-4-01	TC-11	Limiter Plate Decoup.
32	.02	400	46AW203J	484-02	DT4S2	ST-4-02	TC-12	Limiter Screen Byp.
33	.02	400	46AW203J	484-02	DT4S2	ST-4-02	TC-12	Limiter Decoupling
34	.02	400	46AW203J	484-02	DT4S2	ST-4-02	TC-12	3rd IF Decoupling
35	.02	400	46AW203J	484-02	DT4S2	ST-4-02	TC-12	3rd IF Screen Bypass
36	.01	400	46AW103J	484-01	DT4S1	ST-4-01	TC-11	3rd IF Cathode Bypass
37	.05	200	46AU503J	484-05	DT2S5	ST-4-05	TC-15	Audio Coupling
38	.05	200	46AU503J	484-05	DT2S5	ST-4-05	TC-15	Noise Limiter Bias
39	.01	600	46AY103J	684-01	DT6S1	ST-6-01	TC-11	3rd IF Grid Filter
40	.01	400	46AW103J	484-01	DT4S1	ST-4-01	TC-11	AVC Filter
41	.02	400	46AW203J	484-02	DT4S2	ST-4-02	TC-12	2nd IF Plate Decoup.
42	.05	400	46AW503J	484-05	DT4S5	ST-4-05	TC-15	2nd IF Screen Bypass
43	.05	200	46AU503J	484-05	DT2S5	ST-4-05	TC-15	2nd IF Cathode Bypass
44	.01	400	46AW103J	484-01	DT4S1	ST-4-01	TC-11	AVC Filter
45	.05	400	46AW503J	484-05	DT4S5	ST-4-05	TC-15	1st IF Decoupling
46	.02	400	46AW203J	484-02	DT4S2	ST-4-02	TC-12	1st IF Screen Bypass
47	.05	200	46AU503J	484-05	DT2S5	ST-4-05	TC-15	1st IF Cathode Bypass
48	.02	400	46AW203J	484-02	DT4S2	ST-4-02	TC-12	AVC Filter
49	.05	400	46AW103J	484-05	DT4S5	ST-4-05	TC-15	Conv. Plate Decoup.
50	.02	400	46AW203J	484-02	DT4S2	ST-4-02	TC-12	Osc. Plate Decoup.
51	.01	400	46AW103J	484-01	DT4S1	ST-4-01	TC-11	Conv. Cathode Bypass
52	.01	400	46AW103J	484-01	DT4S1	ST-4-01	TC-11	" " "
53	.01	400	46AW103J	484-01	DT4S1	ST-4-01	TC-11	Mixer Cathode Bypass
54	.01	400	46AW103J	484-01	DT4S1	ST-4-01	TC-11	2nd RF Screen Decoup.
55	.02	400	46AW202J	484-02	DT4S2	ST-4-02	TC-12	2nd RF Plate Decoup.
56	.02	400	46AW203J	484-02	DT4S2	ST-4-02	TC-12	2nd RF Plate Decoup.
57	.05	200	46AU503J	484-05	DT2S5	ST-4-05	TC-15	2nd RF Cathode Bypass

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: HALLICRAFTERS PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
106	150Ω	½	RC20AE151K		Br.-Grn.-Br. 2nd RF Cathode
107	47KΩ	1	RC30AE473K	BTA-47K	Yl.-Vi.-Or. 2nd RF Screen Dropping
108	330Ω	½	RC20AE331K		Or.-Or.-Br. Parasitic Suppressor-See Note 2
109	1000Ω	½	RC20AE102M	BTS-1000	Br.-Blk.-Red 1st RF Screen Dropping
110	100KΩ	1	RC30AE104M	BTA-100K	Br.-Blk.-Yl. Voltage Dropping
111	2200Ω	½	RC20AE222M	BTS-2200	Red-Red-Red 2nd RF Plate Decoupling
112	1200Ω	½	RC20AE122K	BTS-1200	Br.-Red-Red 2nd " " "
113	3000Ω	½		BTS-2700	Or.-Blk.-Red Parasitic Suppressor-See Note 3
114	15Ω	½	RC20AE150M		Br.-Grn.-Blk. " " "
115	2200Ω	½	RC20AE222M	BTS-2200	Red-Red-Red Decoupling
116	2.2 Meg.	½	RC20AE225M	BTS-2.2 Meg.	Red-Red-Grn. Converter Grid
117	1000Ω	½	RC20AE102M	BTS-1000	Br.-Blk.-Red Converter Cathode
118	47Ω	½	RC20AE470M		Yl.-Vi.-Blk. Parasitic Suppressor
119	4700Ω	½	RC20AE472K	BTS-4700	Yl.-Vi.-Red Converter Cathode
120	33Ω	½	RC20AE330M		Or.-Or.-Blk. Parasitic Suppressor
121	56Ω	½	RC20AE560K		Grn.-Blue-Blk. " " "
122	4700Ω	½	RC20AE472K	BTS-4700	Yl.-Vi.-Red Converter Cathode
123	15Ω	½	RC20AE150M		Br.-Grn.-Blk. Parasitic Suppressor
124	15Ω	½	RC20AE150M		Br.-Grn.-Blk. " " "
125	10KΩ	½	RC20AE103K	BTS-10K	Br.-Blk.-Or. Oscillator Grid
126	5600Ω	1	RC30AE562K	BTA-5600	Grn.-Blue-Red Oscillator Plate Load
127	470Ω	1	RC20AE471M	BTS-470	Yl.-Vi.-Br. Oscillator Plate Decoupling
128	68KΩ	1	RC30AE683K	BTA-68K	Blue-Gray-Or. Converter Plate Decoup.
129	120Ω	½	RC20AE121K	BW-½-120	Br.-Red-Br. AVC Shunt
130	1000Ω	½	RC20AE102M	BTS-1000	Br.-Blk.-Red AVC Network
131	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Br.-Blk.-Grn. " "
132	270Ω	½	RC20AE271K		Red-Vi.-Br. 1st IF Cathode
133	56KΩ	½	RC20AE563K	BTS-56K	Grn.-Blue-Or. 1st IF Screen Dropping
134	1000Ω	½	RC20AE102M	BTS-1000	Br.-Blk.-Red 1st IF Decoupling
135	1.2 Meg.	½	RC20AE125K	BTS-1.2 Meg.	Br.-Red-Grn. 2nd IF Grid
136	330Ω	½	RC20AE331K		Or.-Or.-Br. 2nd IF Cathode
137	56KΩ	½	RC20AE563K	BTS-56K	Grn.-Blue-Or. 2nd IF Screen Dropping
138	1200Ω	½	RC20AE122K	BTS-1200	Br.-Red-Red 2nd IF Plate Decoupling
139	68KΩ	½	RC20AE683K	BTS-68K	Blue-Gray-Or. 3rd IF Transformer Shunt
140	1800Ω	½	RC20AE182K	BTS-1800	Br.-Gray-Red 3rd IF Cathode
141	47KΩ	1	RC30AE473K	BTA-47K	Yl.-Vi.-Or. 3rd IF Screen Dropping
142	10KΩ	1	RC30AE103M	BTA-10K	Br.-Blk.-Or. 3rd IF Plate Load
143	1000Ω	½	RC20AE102M	BTS-1000	Br.-Blk.-Red 3rd IF Decoupling
144	2.2 Meg.	½	RC20AE225M	BTS-2.2 Meg.	Red-Red-Grn. Noise Limiter Diode Load
145	470KΩ	½	RC20AE474M	BTS-470K	Yl.-Vi.-Yl. Noise Limiter Bias Network
146	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Br.-Blk.-Grn. Noise Limiter Bias Network
147	100KΩ	½	RC20AE104M	BTS-100K	Br.-Blk.-Yl. Noise Limiter Input
148	330KΩ	½	RC20AE330K	BTS-330K	Or.-Or.-Yl. Noise Limiter Input
149	47KΩ	½	RC20AE473K	BTS-47K	Yl.-Vi.-Or. Limiter Grid Filter
150	47KΩ	½	RC20AE473K	BTS-47K	Yl.-Vi.-Or. Limiter Grid Filter
151	220KΩ	½	RC20AE224K	BTS-220K	Red-Red-Yl. Limiter Grid
152	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
153	220KΩ	½	RC20AE224K	BTS-220K	Red-Red-Yl. " "
154	2.2 Meg.	½	RC20AE225M	BTS-2.2 Meg.	Red-Red-Grn. 3rd IF Grid
155	1000Ω	½	RC20AE102M	BTS-1000	Br.-Blk.-Red 3rd IF Decoupling
156	56KΩ	½	RC20AE563K	BTS-56K	Grn.-Blue-Or. Limiter Screen Dropping
157	330Ω	½	RC20AE331K		Or.-Or.-Br. Limiter Plate Decoupling
158	47KΩ	½	RC20AE473K	BTS-47K	Yl.-Vi.-Or. Discriminator Transformer Shunt
159	150KΩ	½	RC20AE154K	BTS-150K	Br.-Grn.-Yl. De-emphasis
160	1200Ω	½	RC20AE122K	BTS-1200	Br.-Red-Red- BFO Decoupling
161	5100Ω	½	RC20AE512J	BTS-4700	Grn.-Br.-Red BFO Cathode
162	10KΩ	½	RC20AE103K	BTS-10K	Br.-Blk.-Or. BFO Grid
163	1000Ω	½	RC20AE102M	BTS-1000	Br.-Blk.-Red BFO Grid
164	47KΩ	½	RC20AE473K	BTS-47K	Yl.-Vi.-Or. BFO Grid
165	100Ω	½	RC20AE101K		Br.-Blk.-Br. Parasitic Suppressor
166	470KΩ	½	RC20AE474M	BTS-470K	Yl.-Vi.-Yl. FM Output
167	1 Meg.	½	RC20AE105M	BTS-1 Meg.	Br.-Blk.-Grn. BFO Grid
168	1000Ω	2	RC40AE102M	BT-2-1000	Br.-Blk.-Red Tone Compensation
169	10KΩ	½	RC20AE103K	BTS-10K	Br.-Blk.-Or. Feedback
170	56Ω	½	RC20AE560K	BW-½-56	Grn.-Blue-Blk. Feedback
171	1200Ω	½	RC20AE122K	BTS-1200	Br.-Red-Red AF Cathode
172	220KΩ	½	RC20AE224K	BTS-220K	Red-Red-Yl. AF Plate Load
173	220KΩ	½	RC20AE224K	BTS-220K	Red-Red-Yl. Phase Inverter Plate Load
174	1200Ω	½	RC20AE122K	BTS-1200	Br.-Red-Red Phase Inverter Cathode
175	8200Ω	½	RC20AE822K	BTS-8200	Gray-Red-Red Phase Inverter Grid
176	220KΩ	½	RC20AE224K	BTS-220K	Red-Red-Yl. Output Grid
177	220KΩ	½	RC20AE224K	BTS-220K	Red-Red-Yl. " "

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	HALLICRAFTERS PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	
58	.25	200	46AT254J	484-.25	DT2P25	ST-2-25	TC-2	Sensitivity Cont. Byp.
59	.05	200	46AU503J	484-05	DT2S5	ST-4-05	TC-15	AVC Filter
60	.01	400	46AB103J	484-01	DT4S1	ST-4-01	TC-11	1st RF Screen Decoup.
61	.02	400	46AW203J	484-02	DT4S2	ST-4-02	TC-12	Decoupling
62	.02	400	46AW203J	484-02	DT4S2	ST-4-02	TC-12	"
63	.05	200	46AU503J	484-05	DT2S5	ST-4-05	TC-15	1st RF Cathode Byp.
64	.05	200	46AU503J	484-05	DT2S5	ST-4-05	TC-15	AVC Filter
65	680	500	CM25A681K	1468-00075	1W5T7	MO.5-37	1FM-37	Output Grid Bypass
66	560	500	CM25A561K	1468-0005	1W5T6	MO.5-36	1FM-35	De-emphasis
67	47	500	CM20A470K	1468-00005	5W5Q5	MO.5-45	1FM-45	RF Bypass
68	180	500	CM20A181K	1468-0002	5W5T2	MO.5-32	1FM-32	Limiter Grid Filter
69	180	500	CM20A181K	1468-0002	5W5T2	MO.5-32	1FM-32	" " "
70	5000	450	47A168	1467-005	1D5D5	MW.5-25	1FM-25	Fil. Bypass
71	110	500	CC25UK111J	1468-0001	5W5T1	MO.5-31	1FM-31	Osc. Coupling
72	7	500	CC20UK070K					Fixed Trimmer
73	4700	500	CM35C472G					Fixed Pad
74	1500	500	CM30C152G		1R5D15	MWS.5-215		" "
75	470	500	CM20A471G					" "
76	220	500	CM25E221G					" "
77	110	500	CC25UK111J	1468-0001	5W5T1	MO.5-31	1FM-31	Osc. Grid Cap.
78	47	500	CM20A470K	1468-00005	5W5Q5	MO.5-45	1FM-45	RF Coupling
79	15	500	CC20UK150K				MS-415	Fixed Pad
80	5600	500	CM35A562M	1467-006	1D5D6	MW.5-26	1FM-26	RF Bypass
81	2	500	49A002					RF Coupling
82	15	500	CC20UK150K					Fixed Trimmer
83	2	500	49A002					RF Coupling
84	5600	500	CM35A562M	1467-006	1D5D6	MW.5-26	1FM-26	RF Bypass
85	5	500	CC20UK050D	1469-000005	5R5V5	MOS.5-55	MS-55	Fixed Trimmer
86	2	500	49A002					RF Coupling-See Note

Note-Not used in some models.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	HALLICRAFTERS PART No.	IRC PART No.	CLAROSTAT PART No.	
87A	1 Meg.	½	25A549	D13-137	M-63-Z	Volume Control
B	Shaft		Not Req.	A	Not Req.	Attach to 87A per instructions
C	Switch		" "	41	SW-A	" " " " "
88A	10KΩ	½	25A548	D16-116	M-30-V	Sensitivity Control
B	Shaft		Not Req.	A	Not Req.	Attach to 88A per instructions
89	500Ω	2	25C022	W-500	58-500	"S" Meter Adjust

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	HALLICRAFTER PART No.	IRC PART No.	
90	100KΩ	½	RC20AE104M	BTS-100K	Br.-Blk.-Yl. 1st RF Grid
91	15Ω	½	RC20AE150M		Br.-Grn.-Blk. Parasitic Suppressor
92	12Ω	½	RC20AE120K		Br.-Red-Blk. " "
93	150Ω	½	RC20AE151K		Br.-Grn.-Br. 1st RF Cathode
94	330Ω	½	RC20AE331K		Or.-Or.-Br. Parasitic Suppressor-See Note 1
95	15Ω	½	RC20AE150M		Br.-Grn.-Blk. " "
96	330Ω	½	RC20AE331K		Or.-Or.-Br. " "
97	2200Ω	½	RC20AE222M	BTS-2200	Red-Red-Red 1st RF Plate Decoupling
98	1200Ω	½	RC20AE122K	BTS-1200	Br.-Red-Red " " " "
99	2.2 Meg.	½	RC20AE225M	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
100	5.6 Meg.	½	RC20AE565K	BTS-5.6 Meg.	Grn.-Blue-Grn. " "
101	470KΩ	½	RC20AE474M	BTS-470K	Yl.-Vi.-Yl. " "
102	100KΩ	½	RC20AE104M	BTS-100K	Br.-Blk.-Yl. 2nd RF Grid
103	15Ω	½	RC20AE150M		Br.-Grn.-Blk. Parasitic Suppressor
104	15Ω	½	RC20AE150M		Br.-Grn.-Blk. " "
105	2200Ω	½	RC20AE222M	BTS-2200	Red-Red-Red 1st RF Decoupling

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	HALLICRAFTERS PART No.	IRC PART No.	
178	220Ω	2	RC40AE221K	BW-2-220	Red-Red-Br. Output Cathode
179	2000Ω	10	24BG202D	AB-2000	Filter
232	2200Ω	½	RC20AE222K	BTS-2200	Red-Red-Red 3rd IF Cathode
233	1000Ω	½	RC20AE102M	BTS-1000	Br.-Blk.-Red RF Coil Shunt
234	100Ω	½	RC20AE101K		Br.-Blk.-Br. 3rd IF Cathode

Note 1-Part of Item 214. See same for replacement.
Note 2-Part of Item 215. See same for replacement.
Note 3-Some models use 330Ω in this application. Replacement same as #94.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	HALLICRAFTERS PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
180	117V AC @ 1.07A	500V CT @ .142ADC	5.0V AC @ 3.0A	6.3V AC @ 5.3A	52C141	P-6314‡	T22R06#	

#Use universal mounting brackets.
‡Add series resistor to reduce plate voltage.

FILTER CHOKE

ITEM NO.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT 1000r⁄	HALLICRAFT. PART NO.	STANCOR PART NO.	THORDARSON PART NO.	MERIT PART No.	
181	.085A	290Ω	17 Henries	56B067	C-1709	T-20C53	C-2990*	*Drill one new mounting hole.

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		HALLICRAFT. PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.1	PRI.	SEC.1					
182	6000Ω CT	500Ω	480Ω CT	27Ω	55B077				
		SEC.2 5000Ω		SEC.2 270Ω					

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA	
		PRI.	SEC.	HALLICRAFTER PART No.	MEISSNER PART No.
	Band				
183	Ant. Coil 1	34Ω	.5Ω	51B823	
184	" " 3	.5Ω	0Ω	51B826	
185	" " 4	.1Ω	0Ω	51B990	
186	" " 5	0Ω	0Ω	51B828	
187	" " 6	0Ω	0Ω	51B829	
188	RF " 1	.8Ω	2.5Ω	51B824	
189	" " 2	.5Ω	1Ω	51B825	
190	" " 3	.4Ω	.1Ω	51B987	
191	" " 4	.3Ω	0Ω	51B989	
192	" " 5	0Ω	0Ω	51B832	
193	" " 6	0Ω	0Ω	51B833	
194	Conv. " 1	2Ω	2.8Ω	51B985	
195	" " 2	.5Ω	2.5Ω	51B986	

DATE 8/48-#4314-6 SET #44-FOLDER #6

PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

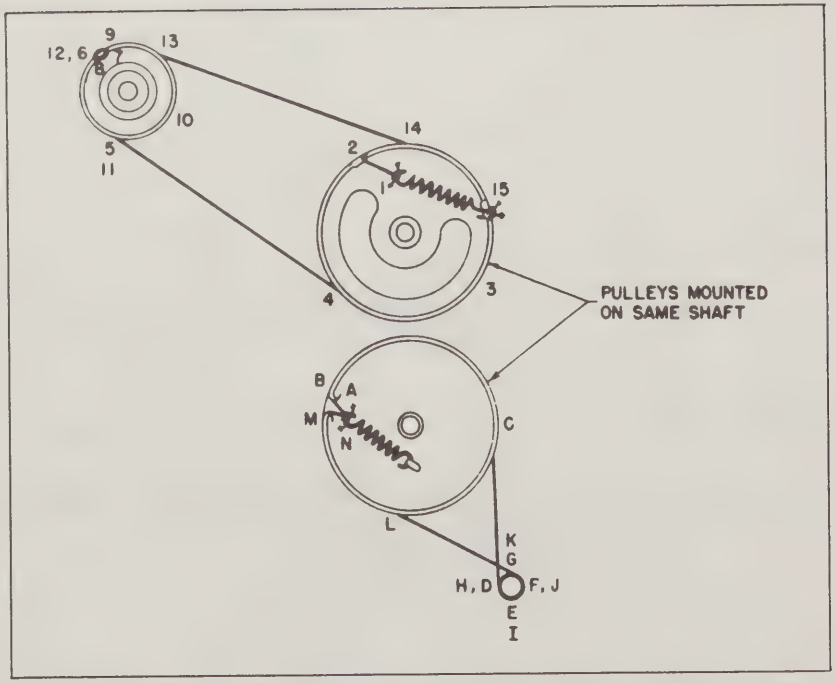
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA HALLICRAFTERS PART No.	REPLACEMENT DATA MEISSNER PART No.	
196	Conv. " 3	.4Ω	.1Ω	51B988		
197	" " 4	.3Ω	0Ω	51B989		
198	" " 5	0Ω	0Ω	51B844		
199	" " 6	0Ω	0Ω	51B833		
200	Osc. " 1	1.7Ω	1.7Ω	51B834		
201	" " 2	.2Ω	.8Ω	51B835		
202	" " 3	.2Ω	.1Ω	51B836		
203	" " 4	.1Ω	0Ω	51B991		
204	" " 5	0Ω	0Ω	51B838		
205	" " 6	0Ω	0Ω	51B839		
206A	1st IF AM	4Ω	15Ω	50C198		
B	" " FM	.7Ω	.7Ω			
207A	2nd IF AM	13Ω†	.3Ω§	50C190		†Incl. both primaries.
B	" " FM		.7Ω			§Band pass winding
208A	3rd IF AM	10Ω‡	.3Ω§	50C220		
B	" " FM		.7Ω			
209	FM IF Coup. Coil		.2Ω	53B104		
210	Disc.Trans	.3Ω	.3Ω	50C191		
211	BFO Trans.	.2Ω	11Ω**	50C032		**AM Osc. winding only.
212	RF Choke		.2Ω	53B008		
213	" "		.2Ω	53B009		
214	" "		.1Ω	53A117		
215	" "		.1Ω	53A117		

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA HALLICRAFTERS PART No.	REPLACEMENT DATA	INSTALLATION NOTES
217-220	Bayonet	6-8	0.25	Blue	39A018		Type 44

MISCELLANEOUS

ITEM No.	PART NAME	HALLICRAFTERS PART No.	NOTES
221	Switch	60D241	Band
222	"	60A234	Selectivity
223	"	60C235	Reception
224	"	60C236	Tone
225	"	60A138	AVC
226	"	60A138	Noise Limiter
227	"	60A138	Receive-Standby
228	Crystal	19A123	
229	Phone Jack	36A029	
230	4 Gang Var. Cap.	48C-158	(19MMF-397MMF) each section
231	4 Gang Band Spread Cap.		(12MMF-90MMF) each section
A21	Trimmer	44A076	Band 1 Osc. Adj.
A26	"	44A077	Band 2 " "
A30	"	44A077	Band 3 " "
A38	"	44A347	Band 4 " "
A42 A50	Dual Trimmer	44A078	Band 5 " " / Band 6 " "
A44 A52	Dual Trimmer	44B165	Band 5 Ant. Adj. / Band 6 " "
A45 A53	Dual Trimmer	44B165	Band 5 1st RF Adj. / Band 6 " " "
A46 A54	Dual Trimmer	44B165	Band 5 2nd RF Adj. / Band 6 " " "
	Meter	82B100	Carrier Level
	Dial	83C330	Main Tuning
	"	83B328	Bandspread
	Dial Pointer	82A110	Main Tuning

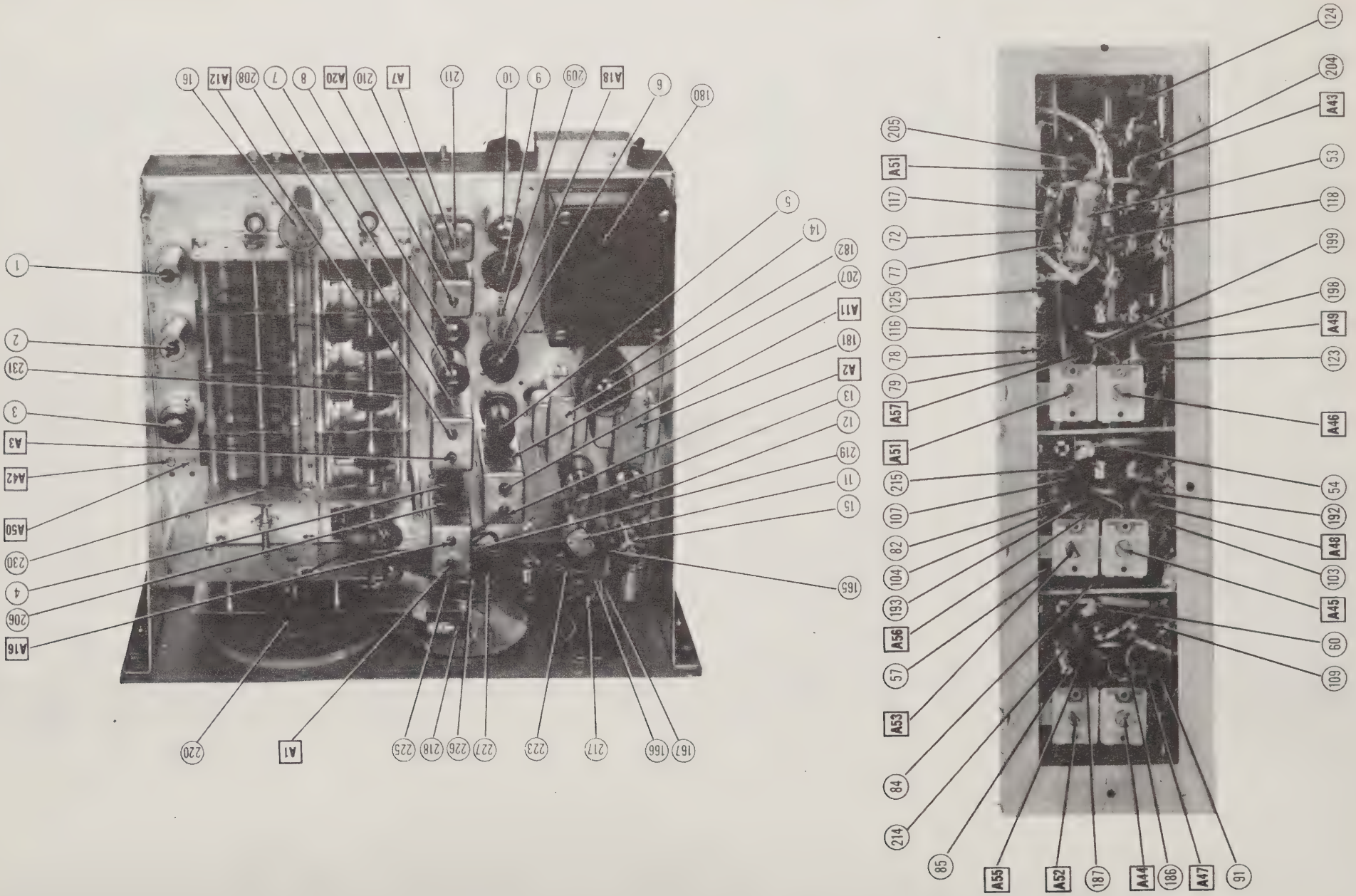


RESTRINGING DIAL CORD

Two dial drive cords are used on the bandspread dial drive mechanism. To restring the upper dial cord, use a length of 18 lb. test cord and tie one end to the tension spring in the large pulley at position 1 in the diagram. Follow the numbers 1 through 15, stretch the tension spring and tie the cord securely. To restring the lower dial cord, tie the cord at A and follow the lettered route A through N as illustrated.

REPLACING LAMPS

There are three dial lamps and one meter lamp. To replace the lamps, it is necessary to remove the receiver chassis from the cabinet and remove the light shield across the top of the dial drive mechanism. The chassis is fastened to the cabinet by four front panel screws and three chassis screws at the bottom rear of the cabinet. The light shield is held down by four screws, two at each end of the channel. Replace the dial lamps with 6-8 V. 250MA. #44 (Blue bead) lamps. The meter lamp is removed by pulling the socket straight out of the grommet. Replace this lamp with 6-8 V. 150MA #47 (Brown bead). Do not use a 250 MA. lamp in the meter housing as the excessive heat will discolor the meter scale.


A16
206
4
230
A50
A42
A3
231
2
1
16
A12
208
7
8
A20
210
A7
211
10
9
209
A18
6
180
5
14
182
207
A11
181
A2
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A57
A46
A51
215
54
107
192
82
A48
104
103
193
A45
A56
60
57
109
A53
84
214
85
A55
A52
187
A44
186
A47
91

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial.

Band spread dial should be at zero unless otherwise specified.

RMA dummy antenna consists of 200 MMFD cap. in series with a 20uh RF Choke with RF Choke shunted by a 400 MMFD cap. in series with a 400Ω carbon resistor.

455 KC IF ALIGNMENT

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

In Step #5 it may be necessary to reduce the set gain to prevent injury to meter. This should be done only with sig. gen. attenuator or sensitivity control. Leave volume control at maximum.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to Pin 1 of 7F8. Low side to chassis.	455KC	.54 - 1.62MC	1MC	Across 500Ω speaker terminals.	A1,A2, A3,A4, A5,A6.	Set sensitivity control full on, noise limiter off, AVC off, standby receive switch to receive, tone control to "HI-FI", selectivity switch to sharp IF, reception switch to AM. Adjust A1,A2,A3,A4,A5 & A6 for maximum output.
2	.1 MFD.	"	455KC (Unmodulated)	"	"	"	A7	Turn reception switch to "CW". Set pitch control to zero. Adjust A7 to zero beat. Then turn pitch control until BFO note is about 1000 CPS off zero beat.
3	.1 MFD.	"	455KC	"	"	"	A4	Turn selectivity control to "broad crystal" and while slowly adjusting A4 rock signal gen. until output (as indicated on meter) decreases and then slowly increases.
4	.1 MFD.	"	Tune to weaker of two signals on either side of zero beat.	"	"	"	A4	Adjust crystal phasing control for null point. Check for correct setting of A4. Adjusting A4 in either direction should cause an increase in output. If it does not, repeat Steps 2, 3 & 4. Leave crystal phasing control at present setting for following adjustments.
5	.1 MFD.	"	455KC	"	"	"	A8	Turn selectivity switch to "Sharp Crystal" and loosen A8 to near minimum capacity. Rock signal gen. and tighten A8 slowly until maximum output is indicated. When max. output has been obtained tighten A8 until output drops about 2 DB. See prealignment notes.
6	.1 MFD.	"	Tune for max. output. Turn 400 ∿ modulation in sig. gen. to on.	"	"	"	A9	Tune for maximum output & note meter reading. Turn selectivity switch to "Crystal Broad" and note drop in output. Turn selectivity switch to "crystal-medium" and with A9 near minimum capacity slowly tighten it while rocking sig. gen. until output meter reads midway between "crystal-sharp" and "crystal-broad" positions.
7	.1 MFD.	"	Tune for max. output with Selectivity switch on "sharp crystal".	"	"	"	A1,A2, A3,A5, A6,A10	Turn selectivity switch to "crystal-sharp" and readjust A1,A2,A3,A5,A6 & A10 for maximum output.
8	.1 MFD	"	(Do not change)	"	"	"	A7	Turn reception switch to "CW" and CW pitch knob to "0". Turn modulation in sig. gen. to off. Adjust A7 for zero beat.

10.7MC IF ALIGNMENT USING AM SIG. GEN. & OUTPUT METER.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
9	.1 MFD.	High side to Pin 1 of 7F8. Low side to chassis.	10.7MC 400 ∿ modulation	28-58 MC	41MC	Across 500Ω speaker terminals.	A11,A12, A13,A14, A15,A16, A17	Turn reception switch to AM, noise limiter off, AVC off, tone control to "HI-FI", volume and sensitivity at maximum and selectivity switch to "normal-sharp". Adjust A11,A12,A13,A14 & A15 for maximum output in order given once only (do not repeat) then adjust A16 & A17 for maximum output.
10	.1 MFD.	"	10.7MC (unmodulated)	"	"	"	A18	Set pitch control to "0". Turn reception switch to "CW". Adjust A18 for zero beat. BFO adjustment is now complete.
11	.1 MFD.	"	10.7MC (400 ∿ modulation)	"	"	"	A19	Turn reception switch to "FM". Adjust A19 for maximum output.
12	.1 MFD.	"	"	"	"	"	A20	Adjust for minimum output Swing sig. gen. above and below minimum output and note value of peaks. If they are unequal adjust A19 until they are equalized. Continue with Step 13 below.

10.7 MC IF ALIGNMENT USING FM SIG. GEN. & SCOPE.

Use freq. modulated signal with 60Ω modulation and 450KC sweep.
Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
9	.1 MFD.	High side to Pin 4 (grid) 6SG7. Low side to chassis.	10.7MC (Freq. Modulated)	27-55MC	41MC	Vertical input to Point Ⓐ. Ground to chassis.	A12,A15, A13	Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1.
10	.1 MFD.	High side to Pin 4 (grid) 6SK7. Low side to chassis.	"	"	"	"	A11, A14	"
11A	.1 MFD.	High side to Pin 1 (grid) 7F8. Low side to chassis.	"	"	"	"	A16, A17	"
11B	.1 MFD.	"	"	"	"	Vertical input to Point Ⓐ. Ground to chassis.	A18	Turn reception switch to "CW". Adjust A18 for coincidence of pip at center of peak of pattern per Fig. 3.
12	.1 MFD.	High side to Pin 6 (grid) 7H7. Low side to chassis.	"	"	"	Vertical input to Point Ⓑ. Ground to chassis.	A19, A20	Alternately adjust A19 for maximum amplitude and A20 for maximum straightness of crossover lines with crossover occuring at center of pattern per Fig. 2.

RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
13	RMA Dummy	High side to ant terminal "A1". Low side to "Ground". Connect jumper from "A2" to "Ground"	1500KC	.54-1.62MC	1500KC	Across 500Ω speaker terminals	A21	Adjust for maximum output
14	"	"	600KC	"	600KC	"	A22	Adjust for maximum output Repeat Steps 13 & 14 until no further improvement can be made.
15	"	"	1500KC	"	Tune for maximum output.	"	A23, A24, A25	Adjust for maximum output
16	"	"	4.5MC	1.62-5MC	4.5MC	"	A26	Adjust for maximum output
17	"	"	2MC	"	2MC	"	A27	Adjust for maximum output Repeat Steps 16 & 17 until no further improvement can be made.
18	"	"	4MC	"	Tune for maximum output.	"	A28, A29	Adjust for maximum output.
19	"	"	14MC	5-15MC	14MC	"	A30	"
20	"	"	7MC	"	7MC	"	A31	Adjust for maximum output. Repeat Steps 19 & 20 until no further improvement can be made.
21	"	"	14MC	"	Tune for max. output	"	A32, A33, A34	Adjust for maximum output.
22	"	"	7MC	"	"	"	A35, A36, A37	Adjust for maximum output. Repeat Steps 21 & 22 until no further improvement can be made.
23	"	"	28MC	15-30MC	28MC	"	A38	Adjust for maximum output
24	"	"	"	"	Tune for max. output	"	A39, A40, A41	Adjust for maximum output
25	300Ω carbon res.	"	50MC	28-55MC	50MC	"	A42	Adjust for maximum output
26	"	"	30MC	"	30MC	"	A43	Adjust for maximum output Repeat Steps 25 & 26 until no further improvement can be made.
27	"	"	50MC	"	Tune for maximum output.	"	A44, A45, A46	Rock tuning cap. and adjust for maximum output
28	"	"	30MC	"	"	"	A47, A48, A49	Rock tuning cap. and adjust for maximum output. Repeat Steps 27 & 28 until no further improvement can be made.
29	"	"	105MC	55-108 MC	105MC	"	A50	Adjust for maximum output.
30	"	"	60MC	"	60MC	"	A51	Adjust for maximum output. Repeat Steps 29 & 30 until no further improvement can be made.
31	"	"	105MC	"	Tune for maximum output.	"	A52, A53, A54	Rock tuning cap. and adjust for maximum output.
32	"	"	60MC	"	"	"	A55, A56, A57	Rock tuning cap. and adjust for maximum output. Repeat Steps 31 & 32 until no further improvement can be made.

FIG. 1

FIG. 2

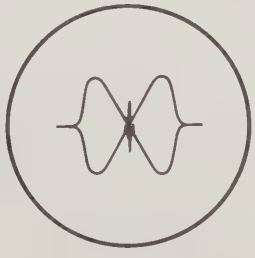
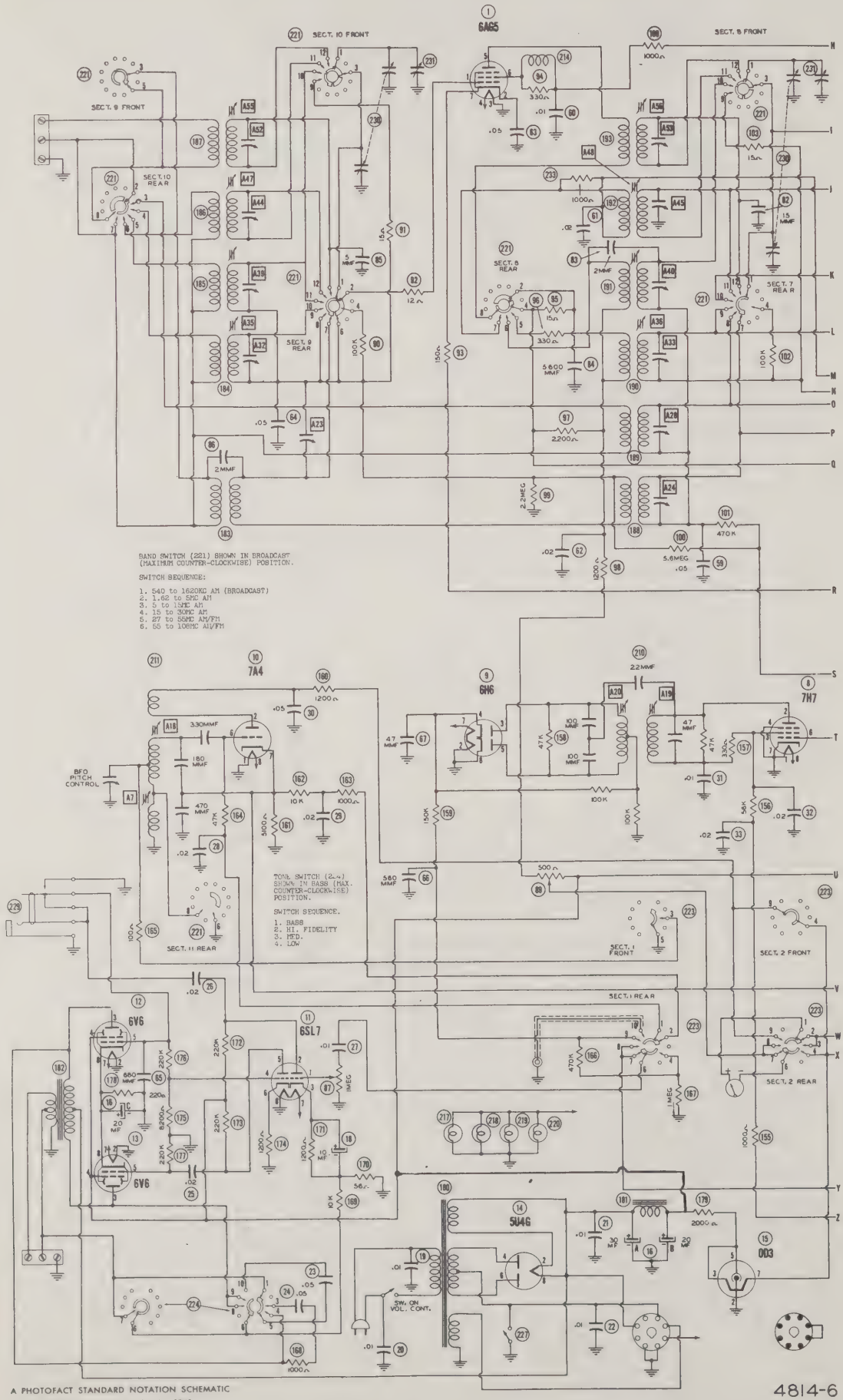


FIG. 3



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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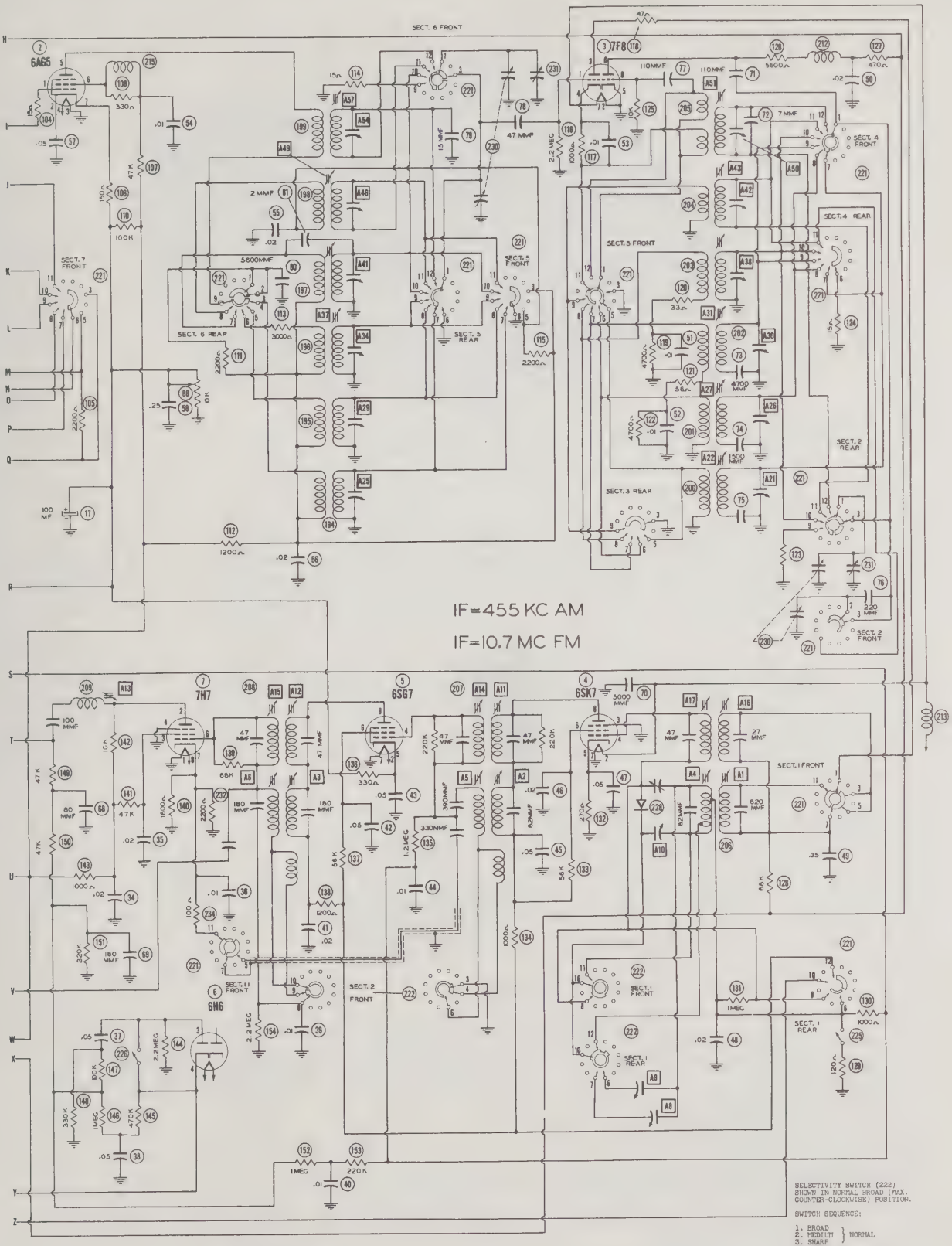

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VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION

VOLTAGE READINGS

	Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
	1	6AG5	0V.	1.4VDC	0V.	6.3VAC	225VDC	140VDC	1.4VDC	-
	2	6AG5	0V.	1.5VDC	0V.	6.3VAC	240VDC	175VDC	1.5VDC	-
	3	7F8	-2.5VDC§	0V.	75VDC	1.1VDC	0V.	125VDC	6.3VAC	-3VDC§
	4	6SK7	0V.	6.2VAC	0V.	0V.	2.8VDC	110VDC	0V.	240VDC
	5	6SG7	0V.	6.3VAC	2.3VDC	0V.	2.3VDC	145VDC	0V.	245VDC
**	6	6H6	0V.	0V.	-.1VDC	0V.	0V.	-.2VDC	6.3VAC	0V.
	7	7H7	0V.	200VDC	187VDC	0V.	0V.	0V.	5.4VDC	6.3VAC
	8A	7H7	0V.	0V.	0V.	0V.	0V.	-.8VDC	0V.	6.3VAC
‡	8B	7H7	0V.	65VDC	65VDC	0V.	0V.	-.8VDC	0V.	6.3VAC
‡	9	6H6	0V.	0V.	-.8VDC	0V.	.8VDC	0V.	6.3VAC	0V.
†*	10	7A4	0V.	150VDC	0V.	0V.	0V.	14VDC§	27VDC	6.3VAC
	11	6SL7GT	0V.	80VDC	1VDC	0V.	80VDC	1VDC	6.3VAC	0V.
	12	6V6GT	0V.	0V.	280VDC	250VDC	0V.	0V.	6.3VAC	14VDC
	13	6V6GT	0V.	0V.	280VDC	250VDC	0V.	0V.	6.3VAC	14VDC
	14	5U4G	0V.	290VDC	0V.	250VAC	0V.	250VAC	25VDC	290VDC
	15	0D3/VR150	150VDC	0V.	150VDC	0V.	150VDC	0V.	150VDC	0V.

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

	Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
	1	6AG5	1.8 Meg.	150Ω	0Ω	.05Ω	75KΩ	65KΩ	150Ω	-
	2	6AG5	1.8 Meg.	150Ω	0Ω	.05Ω	60KΩ	110KΩ	150Ω	-
	3	7F8	2.2 Meg.	0Ω	130KΩ	1KΩ	0Ω	70KΩ	.05Ω	10KΩ
	4	6SK7	0Ω	.05Ω	0Ω	1.5 Meg.	270Ω	120KΩ	0Ω	60KΩ
	5	6SG7	0Ω	.05Ω	330Ω	2.5 Meg.	330Ω	120KΩ	0Ω	60KΩ
**	6	6H6	0Ω	0Ω	2.2 Meg.	1.6 Meg.	INF.	150KΩ	.05Ω	INF.
	7	7H7	0Ω	70KΩ	110KΩ	0Ω	0Ω	2.2 Meg.	900Ω	.05Ω
	8A	7H7	0Ω	INF.	INF.	0Ω	0Ω	250KΩ	0Ω	.05Ω
‡	8B	7H7	0Ω	120KΩ	120KΩ	0Ω	0Ω	250KΩ	0Ω	.05Ω
‡	9	6H6	0Ω	0Ω	100KΩ	200KΩ	100KΩ	INF.	.05Ω	0Ω
†*	10	7A4	0Ω	60KΩ	100Ω	INF.	INF.	63KΩ	5.1KΩ	.05Ω
	11	6SL7GT	1 Meg.	280KΩ	1.2KΩ	8.2KΩ	280KΩ	1.2KΩ	.05Ω	0Ω
	12	6V6GT	0Ω	0Ω	60KΩ	60KΩ	220KΩ	56Ω	.05Ω	220Ω
	13	6V6GT	0Ω	0Ω	60KΩ	60KΩ	230KΩ	8.2KΩ	.05Ω	220Ω
	14	5U4G	INF.	60KΩ	INF.	44Ω	INF.	47Ω	60KΩ	60KΩ
	15	0D3/VR150	60KΩ	0Ω	60KΩ	220KΩ	60KΩ	INF.	60KΩ	INF.

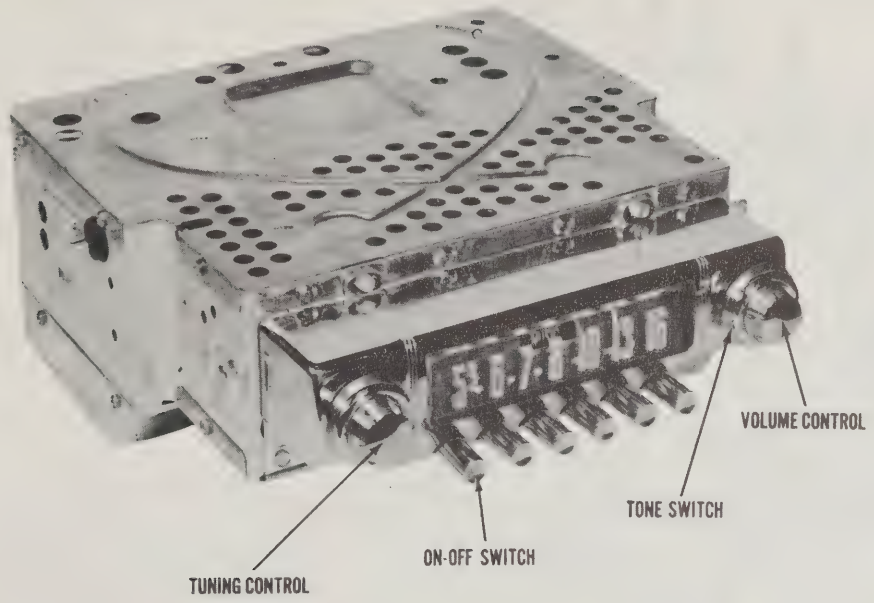
SELECTIVITY CONTROL AT "NORMAL-SHARP" AND SENSITIVITY FULL ON.
†*RECEPTION SWITCH AT CW POSITION. **NOISE LIMITER SWITCH ON.
TONE CONTROL AT LOW. SEND-RECEIVE SWITCH AT RECEIVE. AVC SWITCH ON.
‡ VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

STAGE GAIN MEASUREMENTS			
ANTENNA TO 2nd RF GRID	25X		600KC
2nd RF GRID TO CONV. GRID	.4X		600KC
CONV. GAIN	18X	IN	600KC
		OUT	455KC
1st IF TRANS.	.01X		455KC
1st IF TUBE	200X		455KC
2nd IF TRANS.	.4X		455KC
2nd IF TUBE	150X		455KC
3rd IF TRANS.	1.5X		455KC
3rd IF TUBE	16X		455KC
COUPLING COIL	1X		455KC
AUDIO	30X		400 ∿
OUTPUT	12X		400 ∿

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

LINCOLN MODELS 8ML882 (8L-18805-A), 8ML882Z (8H-18805-A) (Ch. 8E82)



LINCOLN MODEL 8ML882

TRADE NAME	Lincoln, Model 8ML882 (8L-18805-A), 8ML882Z (8H-18805-A) (Ch. 8E82)
SUPPLIER	Lincoln-Mercury, Div. of Ford Motor Car Co., Detroit, Mich.
TYPE SET	Battery Operated Custom Built Automotive Superheterodyne Receiver
TUBES (EIGHT)	Types, 7A7 RF Amp., 7B8 Converter, 6BA6 IF Amp., 7E6 Det.-AVC-AF, 7AF7 AF-Inv., (2) 6V6GT Power Output, 7Y4 Rectifier.
POWER SUPPLY	6 Volt Storage Battery
TUNING RANGE—BROADCAST	540-1600KC RATING 7.6 Amp. @ 6.3 Volts DC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Plug foot volume control in its socket during alignment.

Dummy antenna consists of two 30 MMFD capacitors in series across output of sig. gen. Connect receiver antenna to the junction of the two cap. and low side of sig. gen. to chassis of receiver. This value of dummy antenna must be used to insure proper tracking when receiver is installed in car.

If calibration is off after completing adjustments it can be corrected with adjustment screw at pivot end of pointer arm.

If cores are adjusted, apply speaker cement to core screws.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to Pin 6 (grid) of 7B8. Low side to chassis.	265KC	Tuning slugs fully out.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
2	See pre-alignment notes.	See pre-alignment notes.	535KC	535KC	"	A5	" " " "
3	"	"	1200KC	Tune for maximum output.	"	A6,A7, A8	" " " "
	The following procedure should be followed only when a core or coil has been replaced.						
4	See pre-alignment notes.	See pre-alignment notes.	1700KC	Tuning slugs fully out.	Across voice coil	A5,A6, A7,A8	Screw the cores completely out of the antenna, RF, Converter and oscillator coils. Adjust A5, A6, A7 & A8 for maximum output. Replace cores to their approximate original positions.
5	"	"	1200KC	1200KC	"	A9	Adjust for maximum output.
6	"	"	"	Tune for maximum output.	"	A10,A11 A12	" " " "
7	"	"	600KC	"	"	A13	Rock tuning control and adjust for maximum output. Check receiver at 1200KC. If weak or off calibration repeat Steps 5, 6 and 7.

After all adjustments have been made, reinstall receiver in car. Allow to warm up for at least fifteen minutes, and with antenna extended, tune in weak station near 1200KC and adjust A8 for maximum output.

HOWARD W. SAMS & CO., INC. Indianapolis Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	7A7	7A7	8V	
2	Converter	7B8	7B8	8X	
3	IF Amp.	6BA6	6BA6	7BK	
4A	Det.-AVC-AF	7E6	7E6	8W	
B	Det.-AVC-AF	6SR7GT	6SR7GT	8Q	
5	AF-Inverter	7AF7	7AF7	8AC	
6	Power Output	6V6GT	6V6GT	7AC	
7	" "	6V6GT	6V6GT	7AC	
8	Rectifier	7Y4	7Y4	5AB	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
9A	20	400	22-1484	AF44J4A	UP2245C	DY-312	EL-322	■ Filter
B	20	400						▲ "
C	20	25						Cathode Bypass
10	20	25	22-1553	PRS25/25	BR202A	M-25-25	TA-25	" "
11	.007	1600	22-1713	1689-007	MD1607	STM-16-007	TR-27	Buffer
12	.5	100	22-1728	484-.5	DT2P5	SHH-1	TC-5	Hash Filter
13	.5	120	22-1238	484-.5	DT2P5	SHH-1	TC-5	" "
14	.0033	600	22-1747	684-003	DT6D3	ST-6-003	TC-23	Output Plate Bypass
15	.0033	600	22-1747	684-003	DT6D3	ST-6-003	TC-23	" " "
16	.022	600	22-1750	684-02	DT6S2	ST-6-02	TC-12	Audio Coupling
17	.022	600	22-1750	684-02	DT6S2	ST-6-02	TC-12	" "
18	.1	400	22-1748	484-.1	DT4P1	ST-4-1	TC-1	AF Plate Decoupling
19	.047	600	22-1749	684-05	DT6S5	ST-6-05	TC-15	Audio Coupling
20	.0015	600	22-1743					Tone Comp.
21	.01	200	22-1466	484-01	DT2S1	ST-4-01	TC-11	" "
22	.005	200	22-906	484-005	DT6D5	ST-6-005	TC-25	" "
23	.005	400	22-906	484-005	DT6D5	ST-6-005	TC-25	Audio Coupling
24	.022	200	22-1751	484-02	DT2S2	ST-4-02	TC-12	AVC Filter
25	.1	200	22-190	484-.1	DT2P1	ST-2-1	TC-1	Cathode Bypass
26	.1	400	22-170	484-.1	DT4P1	ST-4-1	TC-1	Screen Bypass
27	.0047	600	22-1752	684-005	DT6D5	ST-6-005	TC-25	Common Coupling
28	250		22-1136	1468-00025	5W5T25	MO.5-325	1FM-325	AF Plate Bypass
29	150		22-1137	1468-00015	5W5T15	MO.5-315	1FM-315	Tone Comp.
30	750		22-242	1468-00075	1W5T7	MO.3-37	1FM-37	" "
31	100		22-1730	1468-0001	5W5T1	MO.5-31	1FM-31	IF Coupling-Cer.
32	100		22-1730	1468-0001	5W5T1	MO.5-31	1FM-31	Osc. Feedback-Cer.
33	100		22-1730	1468-0001	5W5T1	MO.5-31	1FM-31	Osc. Grid Cap.-Cer.
34	260		22-1712					Fixed Trimmer-Cer.
35	250		22-182	1469-00025	5R5T25	MOS.5-325	MS-325	" "
36	100		22-1730	1468-0001	5W5T1	MO.5-31	1FM-31	RF Coupling-Cer.

CONTROLS

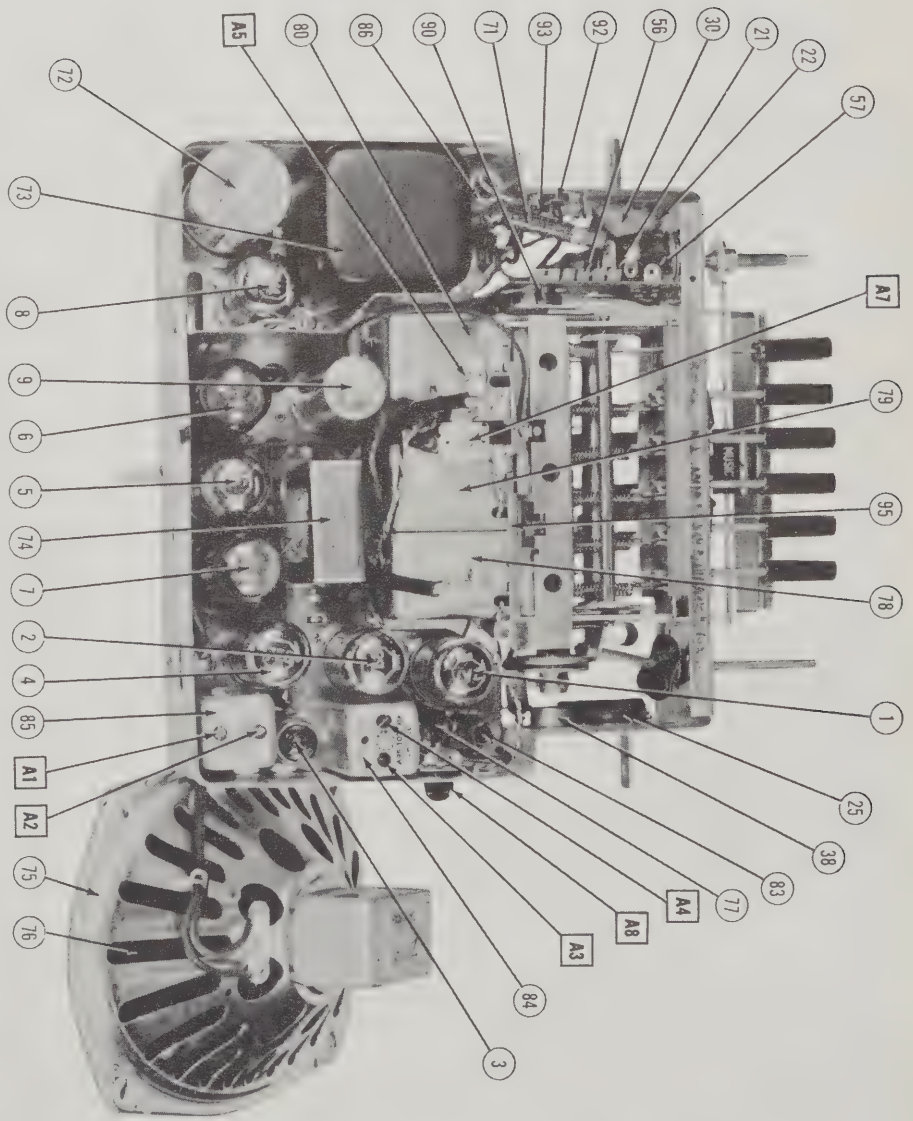
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
37	1 Meg.	½	63-1590			#Volume Control and Tone Switch
38	800Ω	1	63-1379			Sensitivity Control

#Tapped @ 200KΩ and 400KΩ.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	IDENTIFICATION CODES
39	330KΩ	½	63-1891	BTS-330K	Or.-Or.-Yl. RF Grid
40	10KΩ	½	63-1827	BTS-10K	Br.-Blk.-Or. RF Plate Load
41	330KΩ	½	63-1891	BTS-330K	Or.-Or.-Yl. Conv. Grid
42	68KΩ	½	63-1862	BTS-68K	Blue-Gray-Or. Osc. Grid

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

43	12 Meg.	½	63-1960	BTS-12 Meg.	Br.-Red-Blue AVC Network-See Note
44	18KΩ	½	63-1835	BTS-18K	Br.-Gray-Or. Osc. Grid
45	15KΩ	½	63-1835	BTS-15K	Br.-Grn.-Or. Conv. Screen Dropping
46	1 Meg.	½	63-1912	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
47	1 Meg.	½	63-1912	BTS-1 Meg.	Br.-Blk.-Grn. " "
48	470Ω	½	63-1771	BTS-470	Yl.-Vi.-Br. IF Cathode
49	33KΩ	1	63-1598	BTA-33K	Or.-Or.-Or. Screen Dropping
50	220KΩ	½	63-1884	BTS-220K	Red-Red-Yl. Tone Compensation
51	220KΩ	½	63-1884	BTS-220K	Red-Red-Yl. Diode Load
52	1500Ω	½	63-1792	BTS-1500	Br.-Grn.-Red 1st AF Cathode
53	56KΩ	½	63-1959	BTS-56K	Grn.-Blue-Or. 1st AF Plate Load
54	27KΩ	½	63-1843	BTS-27K	Red-Vi.-Or. 1st AF Plate Decoup.
55	120KΩ	½	63-1837	BTS-120K	Br.-Red-Yl. Tone Compensation
56	68KΩ	½	63-1862	BTS-68K	Blue-Gray-Or. " "
57	100KΩ	½	63-1868	BTS-100K	Br.-Blk.-Yl. " "
58	56KΩ	½	63-1959	BTS-56K	Grn.-Blue-Or. " "
59	330KΩ	½	63-1881	BTS-330K	Or.-Or.-Yl. 2nd AF Grid
60	56KΩ	½	63-1959	BTS-56K	Grn.-Blue-Or. 2nd AF Plate Load
61	1000Ω	½	63-1785	BTS-1000	Br.-Blk.-Red AF Cathode
62	33KΩ	½	63-1846	BTS-33K	Or.-Blk.-Or. Phase Inv. Grid
63	56KΩ	½	63-1959	BTS-56K	Grn.-Blue-Or. Phase Inv. Plate Load
64	330KΩ	½	63-1890	BTS-330K	Or.-Or.-Yl. Output Grid
65	330KΩ	½	63-1890	BTS-330K	Or.-Or.-Yl. " "
66	33Ω	2	63-1622	BW-2-33Ω	Or.-Or.-Br. Output Cathode
67	470KΩ	½	63-1897	BTS-470K	Yl.-Vi.-Yl. Feedback
68	1800Ω	2	63-1620	BT-2-1800	Br.-Gray-Red Filter
69	82Ω	½	63-1740	BW-½-82	Gray-Red-Blk.-Hash Suppressor
70	82Ω	½	63-1740	BW-½-82	Gray-Red-Blk. " "
71	5.1Ω	2	63-1375	BW-2-4.7	Grn.-Br. Gold Series Pilot Light

Note-Not used in all models.

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: RADIART PART No.	INSTALLATION NOTES
72	Interrupter	6.3V DC	115 ∿	190-22A	5300	

TRANSFORMER (VIBRATOR)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDARSON PART No.	REPLACEMENT DATA: MERIT PART No.
73	6.3V DC @ 4.4A	590V AC .067A DC			95-1071		T-22R20*	

*Drill new mounting holes.

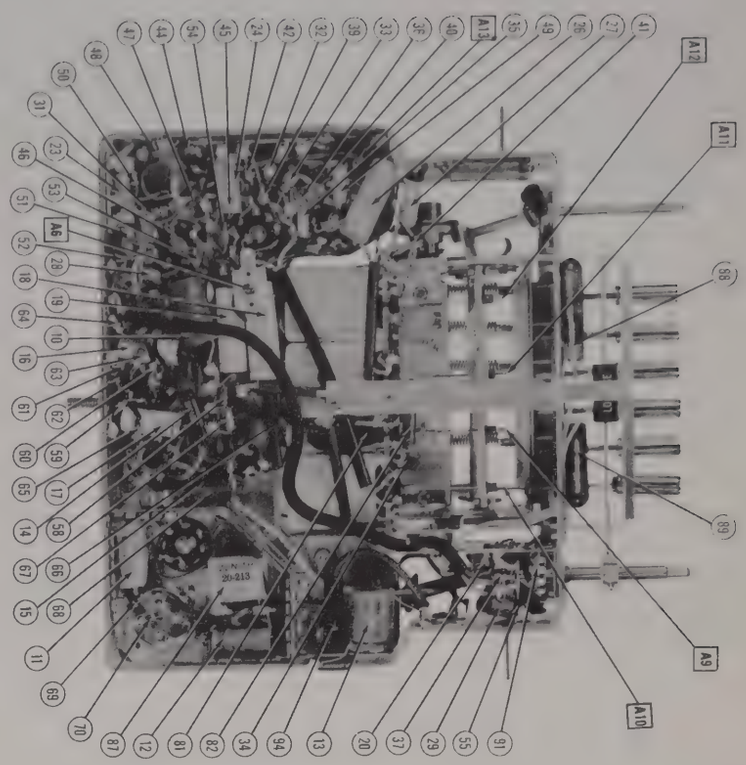
TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDAR'N PART No.	REPLACEMENT DATA: MERIT PART No.	INSTALLATION NOTES
74	9000Ω CT	3.6Ω	370Ω CT	.6Ω	95-1079	A-3823	T-22847†	A-2938	†Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	INSTALLATION NOTES
	FIELD	VC IMP.				
75	PM	3.6Ω	49-627		69A3	
	CONE DIA.	VC DIA.				
76	6"x9"	3/4"				

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: MEISSNER PART No.
77	Ant. Loading		.9Ω	S-9819	
78	Ant. Coup.		13Ω	S-14227	
79	Ant. Coil		13Ω	S-14227	
80	RF Coil		13Ω	S-19227	
81	Osc. Coil		7.9Ω	S-14228	
82	Osc. Trimmer Coil		.7Ω	S-14226	
83	Osc. Shunt Coil	3.6Ω	4.8Ω	S-14225	
84	Input IF	45Ω	45Ω	95-1077	
85	Output IF	60Ω		95-1078	
86	RF Choke		.1Ω	S-11232	
87	" "		.1Ω	20-213	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA:	INSTALLATION NOTES
88	Bayonet	6-8	0.25	Blue			Type 44
89	"	6-8	0.25	"			" "

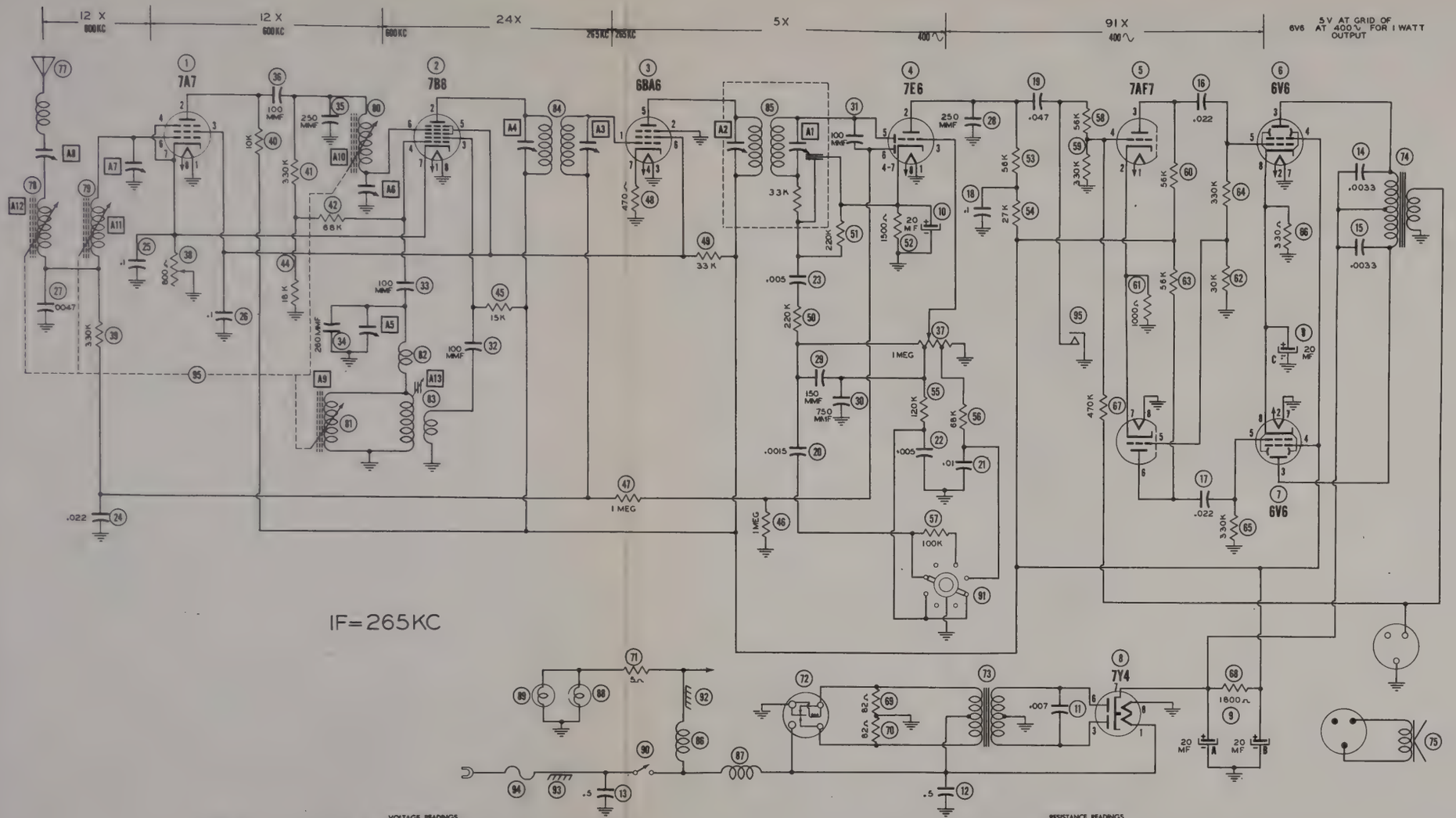
MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
90	Switch	85-435	On-Off
91	"		Tone
92	Spark Plate		
93	" "		14 Amp.
94	Fuse	136-11	
	Tuning Assby.	S-14295	
A5	Trimmer Strip	22-1722	Osc. Adj.
A7			Ant. Adj.
A6	Trimmer	22-1715	RF Adj.
A8	"	22-1721	Ant. Adj.
	Dial Scale	26-392	
	Dial Pointer	59-208	

PUSHBUTTON ADJUSTMENTS

1. Turn set on and allow to warm up for at least fifteen minutes.
2. Make up a list of stations desired to be set up.
3. Tune in the first station selected with the manual tuning control.
4. Loosen any button for this station, by turning counter-clockwise a few turns.
5. Push button completely in and release.
6. Tighten the button firmly.
7. To check accuracy of setting, detune with manual control and retune with push-button. If setting is off repeat Steps 3, 4, 5 and 6.
8. To set up the remaining buttons follow the procedure outlined above.

DATE 8/47-#4814-7 SET #44-FOLDER #7
DATE 8/47-#4814-7 SET #44-FOLDER #7



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	7A7	0V.	200VDC	95VDC	6.6VDC††	0V.	0V.	6.6VDC††	6.2VDC
2	7B8	6.2VDC	220VDC	160VDC	-6.5VDC§	95VDC	-1VDC	6.6VDC††	0V.
3	6BA6	0V.	0V.	0V.	6.2VDC	220VDC	95VDC	2.7VDC	-
4	7E6	0V.	68VDC	0V.	2.5VDC	1VDC	0V.	2.5VDC	6.2VDC
5	7AF7	6.2VDC	4.3VDC	98VDC	0V.	0V.	98VDC	4.3VDC	0V.
6	6V6GT	0V.	6.2VDC	255VDC	215VDC	0V.	0V.	0V.	13VDC
7	6V6GT	0V.	6.2VDC	255VDC	215VDC	0V.	0V.	0V.	13VDC
8	7Y4	6.2VDC	0V.	295VAC	295VAC	0V.	295VAC	260VDC	0V.

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	7A7	0Ω	4 Meg.	4 Meg.	800Ω††	0Ω	2.3 Meg.	800Ω††	.1Ω
2	7B8	.1Ω	4 Meg.	4 Meg.	86KΩ	4 Meg.	350KΩ	800Ω††	0Ω
3	6BA6	2 Meg.	0Ω	0Ω	.1Ω	4 Meg.	4 Meg.	470Ω	-
4	7E6	0Ω	4 Meg.	500KΩ	1.5KΩ	255KΩ	1 Meg.	1.5KΩ	.1Ω
5	7AF7	.1Ω	1KΩ	4 Meg.	180KΩ	30KΩ	4 Meg.	1KΩ	0Ω
6	6V6GT	0Ω	.1Ω	4 Meg.	4 Meg.	330KΩ	INF.	0Ω	330Ω
7	6V6GT	0Ω	.1Ω	4 Meg.	4 Meg.	330KΩ	INF.	0Ω	330Ω
8	7Y4	.1Ω	INF.	230Ω	230Ω	INF.	210Ω	4 Meg.	0Ω

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

††READINGS TAKEN WITH SENSITIVITY CONTROL SET AT MAXIMUM

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by connecting negative (-) 3 volts to the AVC line.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

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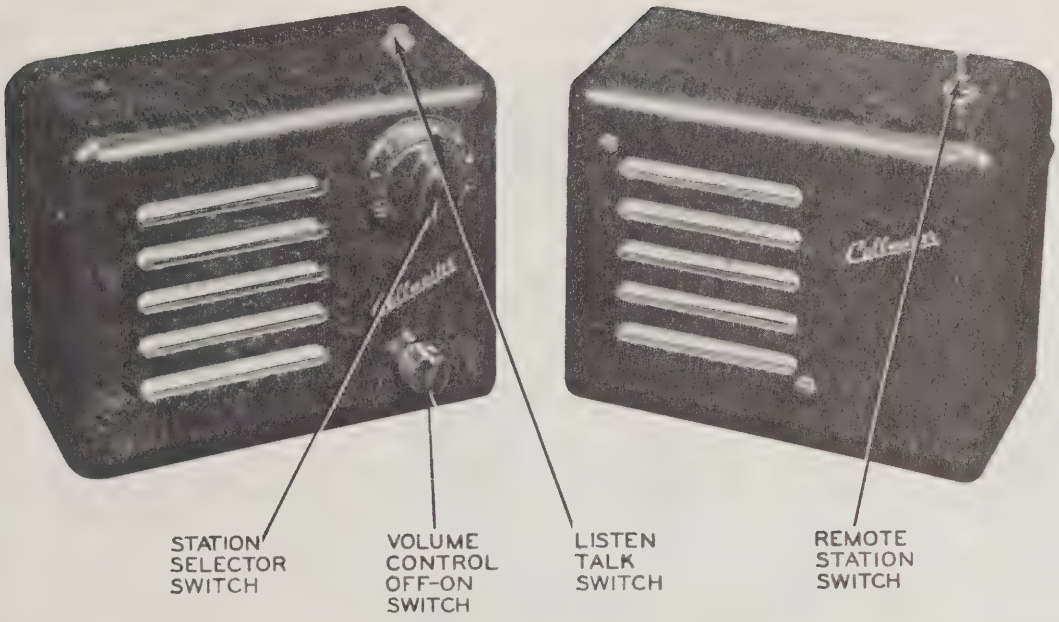

LYMAN MODEL CM20

TRADE NAME	Lyman, Model CM10, CM20
MANUFACTURER	Lyman Electronic Corp., 12 Cass St., Springfield , Mass.
TYPE SET	AC-DC Operated Intercommunication System
TUBES (THREE)	Types, 12SJ7 AF Amp., 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC-DC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SJ7GT	0V.	0V.	0V.	-.5VDC	0V.	15VDC	12VAC	23VDC
2	50L6GT	0V.	60VAC	117VDC	110VDC	0V.	110VDC	12VAC	6.6VDC
3	35Z5GT	0V.	117VAC	112VAC	0V.	110VAC	0V.	85VAC	121VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SJ7GT	INF.	0Ω	0Ω	10 Meg.	0Ω	2 Meg.	12Ω	530KΩ
2	50L6GT	INF.	62Ω	200KΩ	200KΩ	470KΩ	200KΩ	12Ω	140Ω
3	35Z5GT	INF.	250Ω	245Ω	INF.	280Ω	INF.	210Ω	200KΩ

TAKEN IN LISTEN POSITION.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at minimum, no signal applied for voltage measurements.

HOWARD W. SAMS & CO., INC. Indianapolis Indiana

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PARTS LIST AND DESCRIPTIONS

LYMAN MODELS CM10, CM20

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		LYMAN PART No.	STANDARD REPLACEMENT		
1	AF Amp.	12SJ7	12SJ7	8N	
2	Power Output	50L6GT	50L6GT	7AC	
3	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	LYMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	
4A	50	150		PRSA150-30-50	EDL5315	DSB-5030-150	TA-530	Filter-Grn.
B	30	150						" -Red
5	.01	400		484-01	DT4S1	ST-4-01	TC-11	Audio Coupling
6	.01	400		484-01	DT4S1	ST-4-01	TC-11	AF Screen Bypass
7	.03	200		484-03	DT4S3	ST-4-03	TC-13	Audio Coupling
8	.1	400		484-.1	DT4P1	ST-4-1	72P2	Line Isolation
9	150	500		1468-00015	5W5T15	MO.5-315	1FM-315	AF Plate Bypass

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	LYMAN PART No.	IRC PART No.	CLAROSTAT PART No.	
10A	500KΩ	½		D13-133	M-60-Z	Volume Control
B	Shaft			A	Not Req.	Attach to 10A per instructions
C	Switch			41	SW-A	" " " " "

RESISTORS

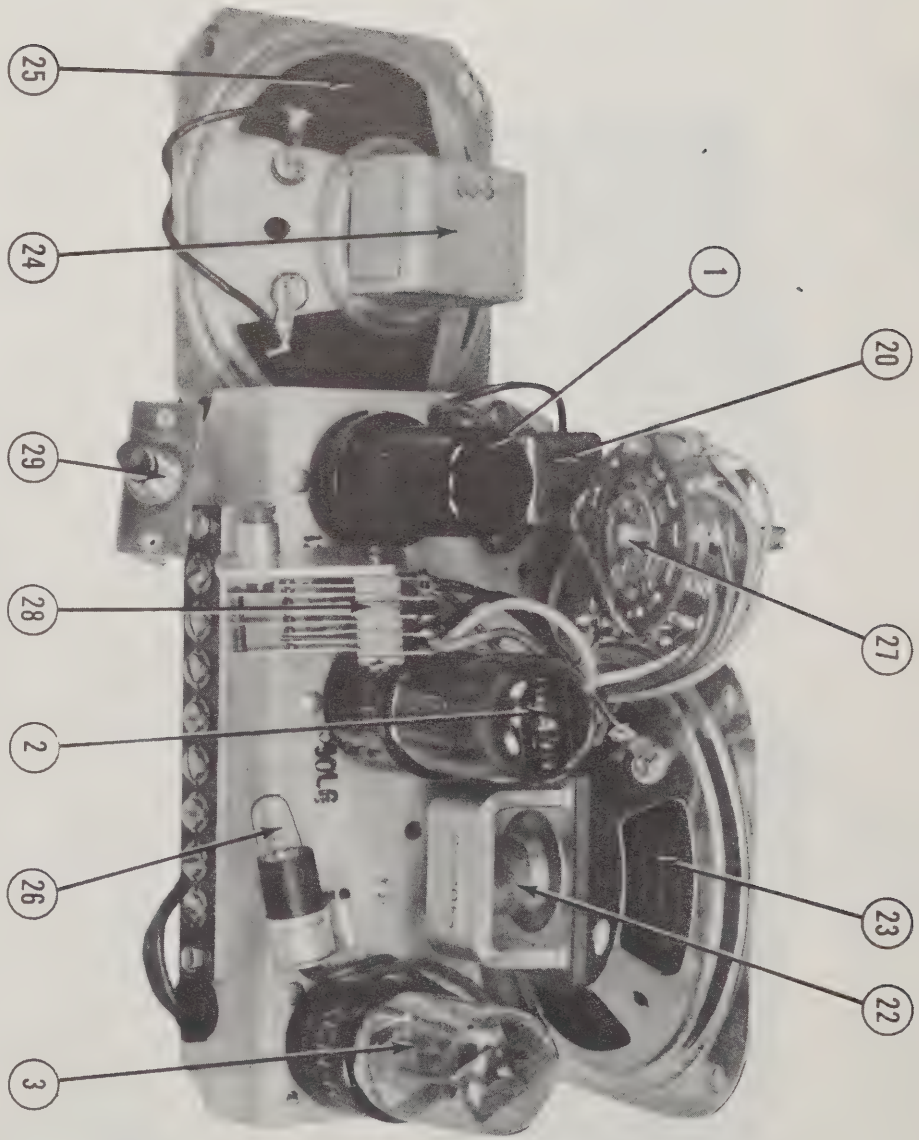
ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	LYMAN PART No.	IRC PART No.	
11	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue AF Grid
12	1.8 Meg.	½		BTS-1.8 Meg.	Br.-Gray-Grn. AF Screen Dropping
13	330KΩ	½		BTS-330K	Or.-Or.-Yl. AF Plate Load
14	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
15	150Ω	1		BW-1-150	Br.-Grn.-Br. Output Cathode
16	3300Ω	½		BTS-3300	Or.-Or.-Red Filter
17	47Ω	1		BW-1-47	Yl.-Vi.-Blk. Rectifier Ballast
18	6000Ω	½		BTS-6800	Blue-Blk.-Red Feedback-See Note
19	150Ω	5		AB-150	Line Dropping

Note-Not used in all models.

TRANSFORMER (INPUT)

ITEM No.	RATING			REPLACEMENT DATA				INSTALLATION NOTES
	TURNS RATIO	DC RES.		LYMAN PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI. to SEC.	PRI.	SEC.					
20	1 to 38	.4Ω	1100Ω		A-4706*	T20A04*		*Drill new mounting holes.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		LYMAN PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
21	1500Ω	3.0Ω	70Ω	.6Ω		A-3865	T22S45	A-2928	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			LYMAN PART No.	JENSEN PART No.	QUAM PART No.	
22	FIELD PM	VC IMP. 3.0Ω		ST-113 Mod. P4-X	4A07	Used in Master Station
23	CONE DIA. 4"	VC DIA. 1/2"				
24	FIELD PM	VC IMP. 3.2Ω		ST-113 Mod. P4-X	4A07	Used in Sub-Station
25	CONE DIA. 4"	VC DIA. 1/2"				

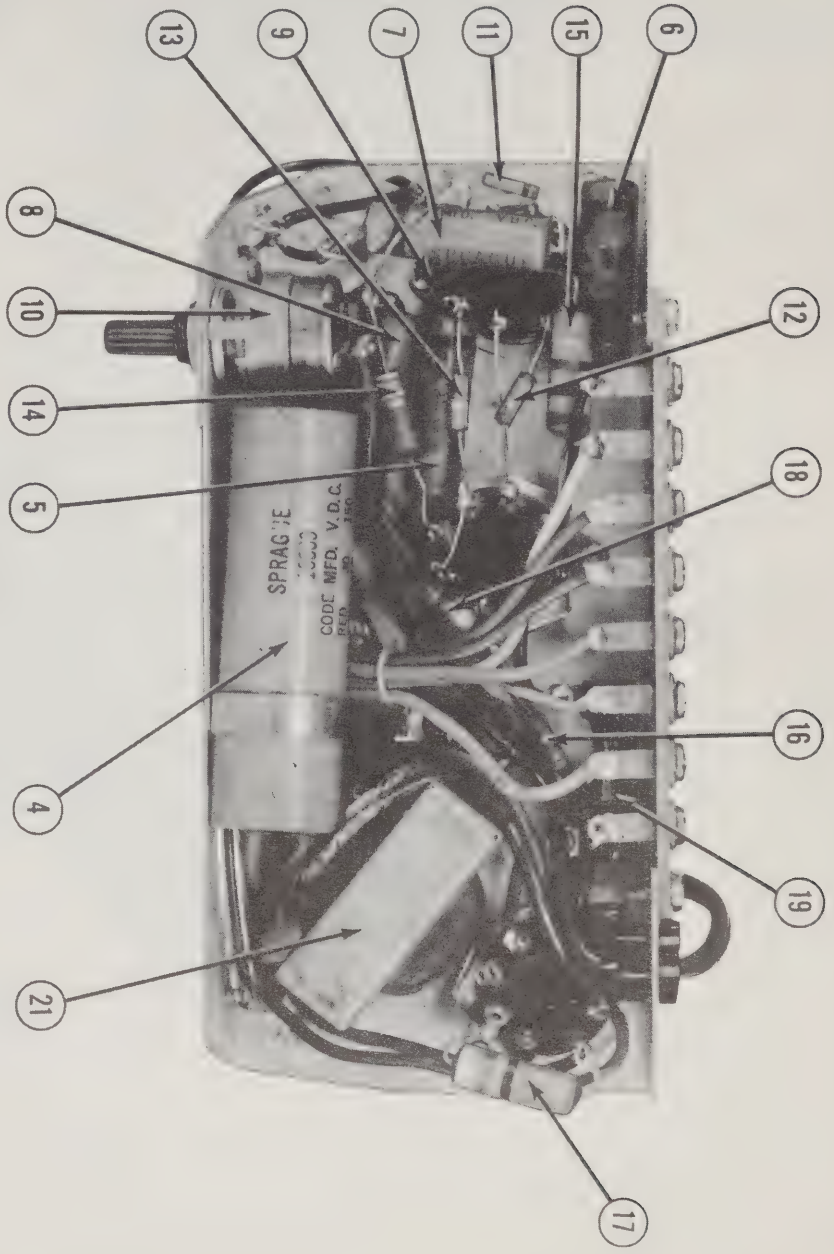
DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					LYMAN PART No.		
26	Bayonet	6-8	0.15	Brown			Type 47

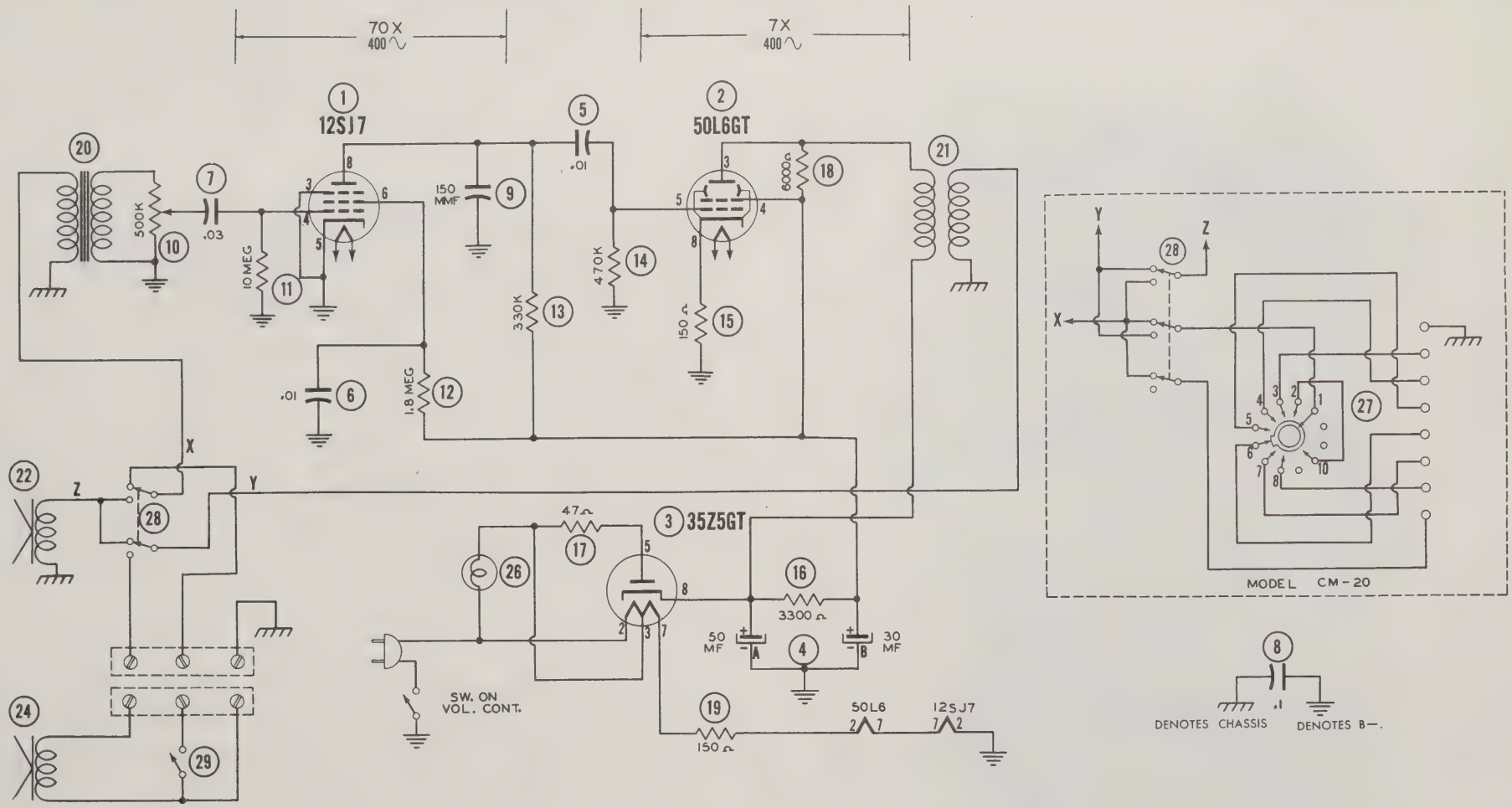
MISCELLANEOUS

ITEM No.	PART NAME	LYMAN PART No.	NOTES
27	Switch		Station Selector (CM20 only)
28	"		Listen-Talk
29	"		Listen-Talk (Remote)

CHASSIS—BOTTOM VIEW



LYMAN MODELS CM10, CM20



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4814-8

PHOTOFACT* Folder

*TRADE MARK

MAGNAVOX CHASSIS MODELS CR-200A, B, C, D, E, F

MAGNAVOX CHASSIS MODELS
CR-200A, B, C, D, E, F

MAGNAVOX CHASSIS MODELS
CR-200A, B, C, D, E, F

MAGNAVOX CHASSIS MODEL CR-200C

TRADE NAME	Magnavox, Chassis Models CR-200A, B, C, D, E, F		
MANUFACTURER	Magnavox Co., 2131 Bueter Rd., Fort Wayne, Indiana		
TYPE SET	AC Operated AM-FM Superheterodyne Receiver with Loop Antenna		
TUBES (ELEVEN)	Types, 6BA6 RF Amp., 6BE6 Converter, 6SG7 1st IF Amp., 6SG7 2nd FM IF-AM Det., 6SH7 Limiter, 6H6 Discriminator, 6SR7 1st AF Amp., 6SN7 Driver-Inverter, (2) 6V6GT Power Output, 5U4G Rectifier.		
POWER SUPPLY	110-120 Volts AC	RATING	.83 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540-1650KC	FREQ. MOD.	88-108MC

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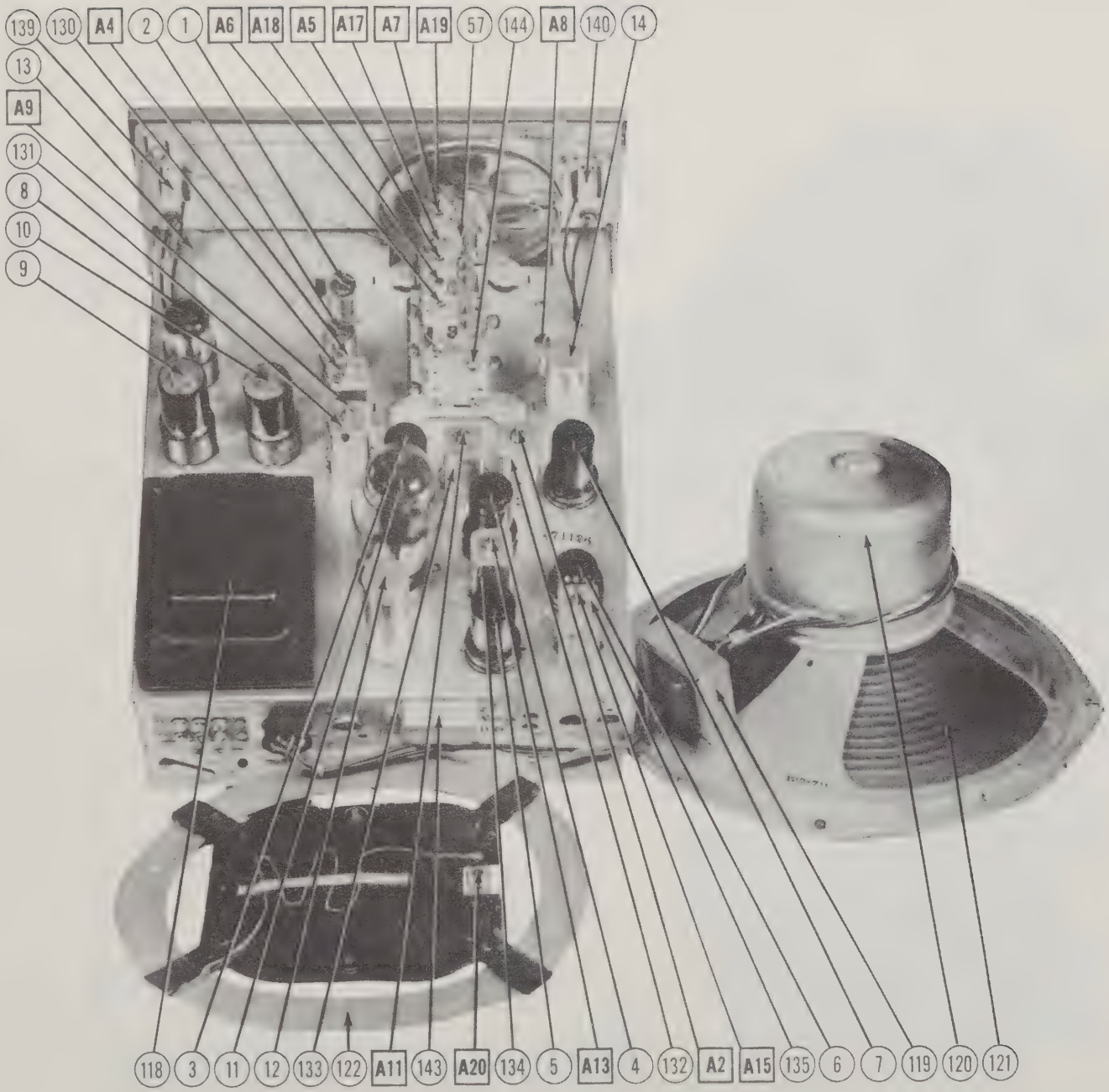
DATE 8/48-#4814-9 SET #44-FOLDER #9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110 108 45 107 111 26 112 104 42 113 43 137 38 76 56 124 65 62 75 142 63 88 89 32 68 52 53 141 61 69

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MAGNAVOX PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	6BA6	6BA6	7BK	
2	Converter	6BE6	6BE6	7CH	
3	1st IF Amp.	6SG7	6SG7	8BK	
4	2nd FM IF-AM Det.	6SG7	6SG7	8BK	
5	Limiter	6SH7	6SH7	8BK	
6	Discriminator	6H6	6H6	7Q	
7	1st AF Amp.	6SR7	6SR7	8Q	
8	Driver Inverter	6SN7	6SN7	8BD	
9	Power Output	6V6GT	6V6GT	7AC	
10	" "	6V6GT	6V6GT	7AC	
11	Rectifier	5U4G	5U4G	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
12A	30	475		AF6J	UP3045	DY-30-450	EL-344#	■ Filter
B	10	475		PRS450/10	BR1045	M-10-450		▲ "
13A	10	450		AF22J4A*	UP1145C*	DY-10-450/25-50	EL-202*	■ Inv. Plate Decoup.
B	20	25						▲ Inv. Cathode Byp.
14A	10	450		AF22J4A	UP1145C	DY-316	EL-202	▲ 1st AF Plate Decoup.
B	10	450						■ 1st AF Cathode Byp. Decoupling
C	20	25						
15	20	25		PRS25/25	BR202A	M-25-25	TA-25	Cathode Bypass
16	.02	600		684-02	DT6S2	MPH-6-02	TC-12	Line Filter
17	.02	600		684-02	DT6S2	MPH-6-02	TC-12	" "
18	.02	600		684-02	DT6S2	MPH-6-02	TC-12	" "
19	.02	600		684-02	DT6S2	MPH-6-02	TC-12	Phono Motor Bypass
20A	.0015	600		1467-0015	1W5D15	MW.5-215	1FM-215	Output Plate Byp.-Note 1
B	.002	600		684-002	DT6D2	ST-6-002	TC-22	" " " -Note 2
21	.02	400		484-02	DT4S2	ST-4-02	TC-12	Tone Comp.
22	.1	400		484-.1	DT4P1	ST-4-1	TC-1	Audio Coupling
23	.03	400		484-03	DT4S3	ST-4-03	TC-13	" "
24	.015	200		484-015	DT4S15			Tone Comp.
25	.005	600		684-005	DT6D5	ST-6-005	TC-25	Audio Coupling
26A	.01	400		484-01	DT4S1	ST-4-01	TC-11	Tone Comp.-Note 3
B	.002	600		684-002	DT6D2	ST-6-002	TC-22	" " Note 4
27	.01	600		684-01	DT6S1	ST-6-01	TC-11	Filament Bypass
28	.01	400		484-01	DT4S1	ST-4-01	TC-11	Lim. Plate Decoup.
29	.01	400		484-01	DT4S1	ST-4-01	TC-11	Lim. Screen Bypass
30	.01	400		484-01	DT4S1	ST-4-01	TC-11	2nd IF Plate Decoup.
31	.01	400		484-01	DT4S1	ST-4-01	TC-11	2nd IF Screen Bypass
32	.01	200		484-01	DT2S1	ST-4-01	TC-11	Audio Coupling
33	.01	400		484-01	DT4S1	ST-4-01	TC-11	1st IF Plate Decoup.
34	.01	400		484-01	DT4S1	ST-4-01	TC-11	1st IF Screen Bypass
35	.01	200		484-01	DT2S1	ST-4-01	TC-11	1st IF Cathode Bypass
36	.05	200		484-05	DT2S5	ST-4-05	TC-15	1st IF Cathode Bypass
37	.01	400		484-01	DT4S1	ST-4-01	TC-11	Conv. Plate Decoup.
38	.05	200		484-05	DT2S5	ST-4-05	TC-15	Conv. Cathode Bypass
39	.05	200		484-05	DT2S5	ST-4-05	TC-15	AVC Filter
40	.01	400		484-01	DT4S1	ST-4-01	TC-11	RF Bypass Pwr. Supply
41	.002	600		684-002	DT6D2	ST-6-002	TC-22	RF Screen Bypass
42	.05	200		484-05	DT2S5	ST-4-05	TC-15	AVC Filter
43	.01	400		484-01	DT4S1	ST-4-01	TC-11	RF Bypass
44	1800	300		1467-002	1W5D2	MW.5-22	1FM-22	Feedback
45	330	500		1468-0003	5W5T3	M0.5-33	1FM-33	Tone Comp.
46	220	500		1468-0002	5W5T2	M0.5-32	1FM-32	AF Plate Bypass
47	470	500		1468-0005	5W5T5	M0.5-35	1FM-35	De-emphasis
48	47	500		1468-00005	5W5Q5	M0.5-45	1FM-45	RF Bypass
49	47	500		1468-00005	5W5Q5	M0.5-45	1FM-45	Limiter Grid Filter
50	220	500		1468-0002	5W5T2	M0.5-32	1FM-32	Diode RF Filter
51	100	500		1468-0001	5W5T1	M0.5-31	1FM-31	" " "
52	100	500		1468-0001	5W5T1	M0.5-31	1FM-31	RF Bypass

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MAGNAVOX PART No.	IRC PART No.	IDENTIFICATION CODES
92	220KΩ	½		BTS-220K	Red-Red-Yl. Limiter Grid
93	8200Ω	1		BTA-8200	Gray-Red-Red Limiter Screen Dropping
94	8200Ω	1		BTA-8200	Gray-Red-Red Bleeder
95	100KΩ	½		BTS-100K	Br.-Blk.-Yl. "
96	68KΩ	½		BTS-68K	Blue-Gray-Or. Limiter Plate Decoupling
97	6000Ω	10		AB-6000	Decoupling
98	150KΩ	½		BTS-150K	Br.-Grn.-Yl. Discriminator Diode Load
99	150KΩ	½		BTS-150K	Br.-Grn.-Yl. " " "
100	100KΩ	½		BTS-100K	Br.-Blk.-Yl. De-emphasis
101	3900Ω	½		BTS-3900	Or.-White-Red 1st AF Cathode
102	33Ω	½		BW-½-33	Or.-Or.-Blk. Hum Balance
103	68Ω	½		BW-½-68	Blue-Gray-Blk. " "
104	10KΩ	1		BTA-10K	Br.-Blk.-Or. Tone Compensation
105	150KΩ	½		BTS-150K	Br.-Grn.-Yl. 1st AF Plate Load
106	22KΩ	½		BTS-22K	Red-Red-Or. 1st AF Plate Decoupling
107	82KΩ	½		BTS-82K	Gray-Red-Or. Tone Compensation
108	47KΩ	½		BTS-47K	Yl.-Vi.-Or. 2nd AF Grid
109	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. Feedback
110	1500Ω	½		BTS-1500	Br.-Grn.-Red 2nd AF Cathode
111	100KΩ	½		BTS-100K	Br.-Blk.-Yl. 2nd AF Plate Load
112	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Phase Inverter Plate Load
113	4700Ω	½		BTS-4700	Yl.-Vi.-Red Phase Inverter Plate Decoupling
114	220KΩ	½		BTS-220K	Red-Red-Yl. Output Grid
115	270KΩ	½		BTS-270K	Red-Vi.-Yl. Output Grid
116	15KΩ	½		BTS-15K	Br.-Grn.-Or. Phase Inverter Grid
117	220Ω	2		BW-2-220	Red-Red-Br. Output Cathode

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MAGNAVOX PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
118	117V AC @ .83A	600V CT .11A DC	5.2V AC @ 3.0A	6.5V AC @ 2.3A SEC. 4 6.6V AC @ 1.8A	C300041		T-22R32#	

#Drill new mounting holes.

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: MAGNAVOX PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	INSTALLATION NOTES
119	7500Ω CT	3.6Ω	400Ω CT	.3Ω	Part of 582806	A-3824	T22S58	A-2904#	#Drill new mounting holes.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: MAGNAVOX PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
120	FIELD 1000Ω	VC IMP. 3.6Ω	582806		12E10†	†Replace output transformer to match 6-8Ω voice coil.
121	CONE DIA. 11½"	VC DIA. 1"				

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
53A	150	500		1468-00015	5W5T15	MO.5-315	1FM-315	Tone Comp.-Note 5
B	470	500		1468-0005	5W5T5	MO.5-35	1FM-35	" " Note 6
54A	8	300						" " Note 2-Cer.
B	33	300						" " Note 1
55	4000	300		1467-004	1D5D4	MW.5-24	1FM-24	Osc. Feedback-Cer.
56	50	300		1468-00005	5W5Q5	MO.5-45	1FM-45	Osc. Grid Cap.-Cer.
57	4	300						Fixed Trimmer-Cer.
58	518	500						Fixed Padder
59	500	300		1468-0005	5W5T5	MO.5-35	1FM-35	RF Coupling-Cer.
60	1000	500		1468-001	1W5D1	MW.5-21	1FM-21	RF Bypass Power Supply
61	100	500		1468-0001	5W5T1	MO.5-31	1FM-31	RF Cathode Bypass
62	10	400		1468-00001	5W5Q1	MO.5-41	MS-41	RF Coupling

‡Parallel sections to obtain desired capacity.
*Omit one section.
Note 1-Used in Models A, B, D & E.
Note 2-Used in Models C & F.
Note 3-Used in Models A, C, D & F..
Note 4-Used in Models B & E.
Note 5-Used in Models A, B, & C.
Note 6-Used in Models D, E, & F.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MAGNAVOX PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
63A	1.5 Meg	½	220074G1	D17-139X		Volume Control tapped @ 150KΩ
B	Shaft		Not Req.	A		Attach to 62A per instructions
64A	500KΩ	½	220072G8	D13-133	M-60-Z	Treble Control
B	Shaft		Not Req.	A	Not Req.	Attach to 63A per instructions
65	150KΩ	½	220073G5			Bass Control

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MAGNAVOX PART No.	IRC PART No.	IDENTIFICATION CODES
66	10KΩ	½		BTS-10K	Br.-Blk.-Or. Antenna Loading
67	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. AVC Network
68	68Ω	½			Blue-Gray-Blk. RF Cathode
69	33KΩ	1		BTA-33K	Or.-Or.-Or. RF Screen Dropping
70	4700Ω	½		BTS-4700	Yl.-Vi.-Red BC-RF Coil Shunt
71	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. AVC Network
72	3.9 Meg.	½		BTS-3.9 Meg.	Or.-White-Grn. " "
73	10KΩ	½		BTS-10K	Br.-Blk.-Or. Converter Grid
74	1000Ω	½		BTS-1000	Br.-Blk.-Red 2nd IF Screen Decoupling
75	220Ω	½			Red-Red-Br. Converter Cathode
76	22KΩ	½		BTS-22K	Red-Red-Or. Oscillator Grid
77	4700Ω	½		BTS-4700	Yl.-Vi.-Red Converter Screen Dropping
78	1000Ω	1		BTA-1000	Br.-Blk.-Red Converter Plate Decoupling
79	68Ω	½			Blue-Gray-Blk. 1st IF Cathode
80	220Ω	½			Red-Red-Br. 1st IF Cathode
81	1000Ω	½		BTS-1000	Br.-Blk.-Red 1st IF Screen Decoupling
82	1000Ω	½		BTS-1000	Br.-Blk.-Red 1st IF Plate Decoupling
83	33KΩ	½		BTS-33K	Or.-Or.-Or. Diode RF Filter
84	33KΩ	½		BTS-33K	Or.-Or.-Or. " " "
85	150KΩ	½		BTS-150K	Br.-Grn.-Yl. Diode Load
86	1.5 Meg.	½		BTS-1.5 Meg.	Br.-Grn.-Grn. 1st AF Grid
87	3.9 Meg.	½		BTS-3.9 Meg.	Or.-White-Grn. Phono Tone Compensation
88	4.7 Meg.	½		BTS-4.7 Meg.	Yl.-Vi.-Grn. Tone Compensation
89	33KΩ	½		BTS-33K	Or.-Or.-Or. " "
90	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. Bleeder
91	1000Ω	½		BTS-1000	Br.-Blk.-Red 2nd IF Plate Decoupling

DATE 8/48-#4614-6 SET #44-FOLDER #5

PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

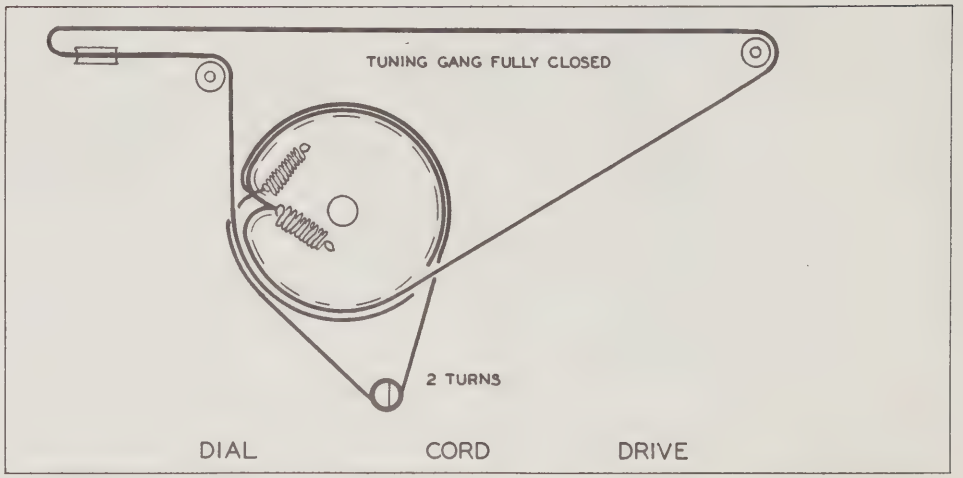
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MAGNAVOX PART No.	REPLACEMENT DATA MEISSNER PART No.
122	BC Loop Ant.		.7Ω	198749	
123	FM Dipole				
124	BC Ant.Coil	20.2Ω	3.1Ω	489746	14-1056
125	FM " "	0Ω	0Ω	-	
126	BC RF "	22.3Ω	3.1Ω	483748	14-1057
127	FM " "		0Ω		
128	BC Osc. "		5.2Ω	489743	14-1060
129	FM " "		.1Ω		
130	AM 1st IF	7.5Ω	7.5Ω	360315G1	
131	FM " "	.7Ω	.7Ω	360316	
132	AM 2nd IF	7.5Ω	7.5Ω	360315G2	
133	FM " "	.7Ω	.7Ω	360316	
134	FM 3rd IF	.7Ω	.7Ω	360316	
135	FM Disc.	.3Ω	.7Ω	360317	
136	RF Plate Choke		.4Ω		
137	RF Filament Choke		.1Ω		
138	"		.1Ω		

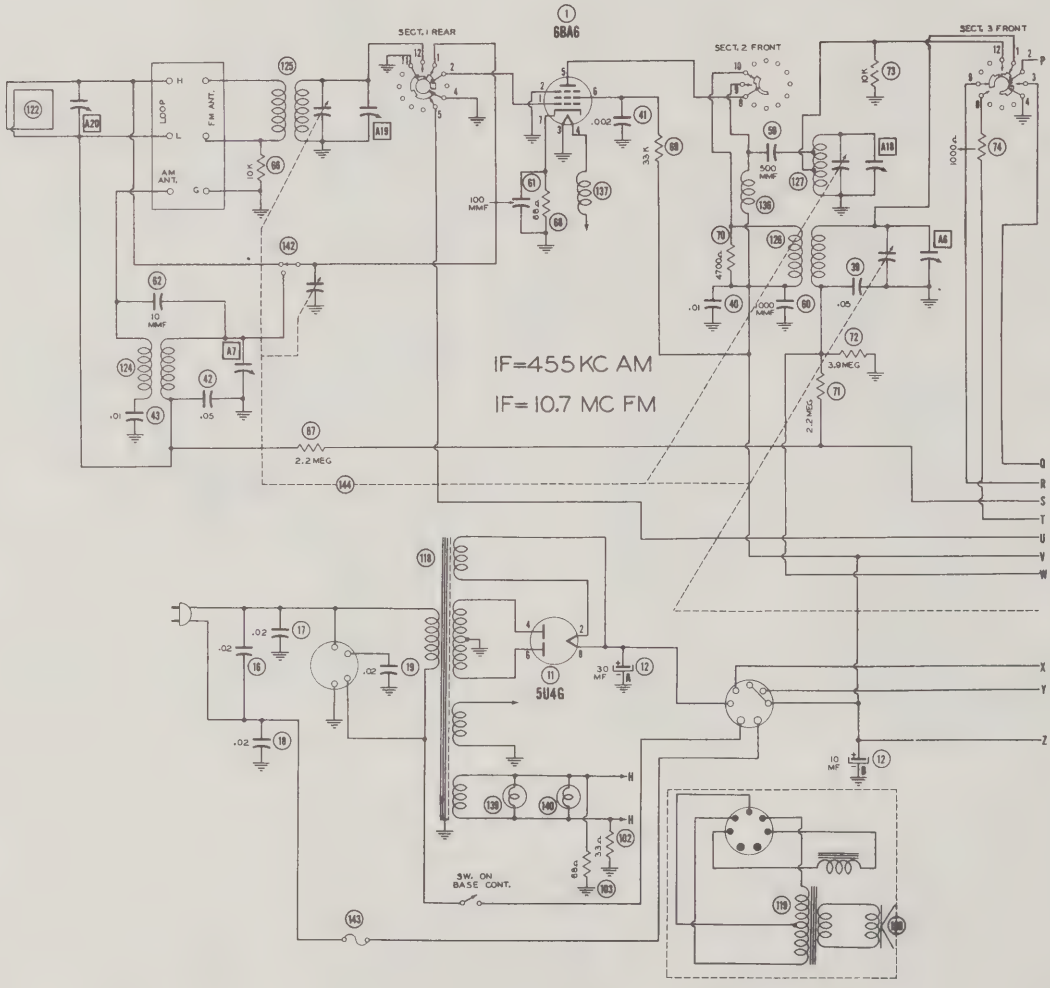
DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA MAGNAVOX PART No.	REPLACEMENT DATA	INSTALLATION NOTES
139	Bayonet	6-8	0.25	Blue			Type 44
140	"	"	"	"			" "

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
141	Switch		AM-FM-Phono-Ext.
142	"		Ant.-Loop
143	Fuse		3 Amp. 250 Volt
144	Tuning Gang	C-260089	(20-520MMF, 20-520MMF, 20-520MMF)





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1A	6BA6	-.1VDC	0V.	0V.	1.3VAC	255VDC	105VDC	.3VDC	-
1B	6BA6	0V.	0V.	0V.	6.3VAC	250VDC	96VDC	.8VDC	-
2A	6BE6	-7.1VDC	1.5VDC	0V.	6.3VAC	255VDC	98VDC	-.1VDC	-
2B	6BE6	-4.6VDC	0V.	0V.	6.3VAC	217VDC	63VDC	0V.	-
3A	6BG7	0V.	0V.	.2VDC	0V.	.2VDC	117VDC	6.6VAC	235VDC
3B	6BG7	0V.	0V.	.6VDC	0V.	.2VDC	13VDC	6.6VAC	210VDC
4A	6BG7	0V.	6.6VAC	0V.	-.6VDC	0V.	-.1VDC	0V.	235VDC
4B	6BG7	0V.	6.6VAC	0V.	-.3VDC	0V.	98VDC	0V.	210VDC
5	6BM7	0V.	6.6VAC	0V.	-.5VDC	0V.	43VDC	0V.	.6VDC
6	6H6	0V.	6.6VAC	-.5VDC	-.1VDC	-.6VDC	-.1VDC	0V.	0V.
7	6SR7	0V.	0V.	3.8VDC	-.1VDC	0V.	72VDC	#	#
8	6SN7	0V.	100VDC	4.6VDC	0V.	105VDC	4.2VDC	#	#
9	6V6GT	0V.	#	248VDC	248VDC	0V.	0V.	#	14VDC
10	6V6GT	0V.	#	248VDC	248VDC	0V.	105VDC	#	14VDC
11	5U4G	0V.	350VDC	1.6VDC	300VAC	0V.	300VAC	0V.	350VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1A	6BA6	2.4 Meg.	0Ω	0Ω	.1Ω	20KΩ	54KΩ	68Ω	-
1B	6BA6	0Ω	0Ω	0Ω	.1Ω	20KΩ	54KΩ	68Ω	-
2A	6BE6	22KΩ	0Ω	0Ω	.1Ω	22KΩ	30KΩ	1.4 Meg.	-
2B	6BE6	22KΩ	220Ω	0Ω	.1Ω	20KΩ	30KΩ	0Ω	-
3A	6BG7	0Ω	0Ω	290Ω	8.2Ω	290Ω	15KΩ	.1Ω	20KΩ
3B	6BG7	0Ω	0Ω	68Ω	8.2Ω	68Ω	15KΩ	.1Ω	20KΩ
4A	6BG7	0Ω	.1Ω	0Ω	130KΩ	0Ω	1 Meg.	0Ω	20KΩ
4B	6BG7	0Ω	.1Ω	0Ω	50KΩ	0Ω	15KΩ	0Ω	20KΩ
5	6BM7	0Ω	.1Ω	0Ω	220KΩ	0Ω	7KΩ	0Ω	50KΩ
6	6H6	0Ω	.1Ω	150KΩ	300KΩ	150KΩ	400KΩ	0Ω	0Ω
7	6SR7	0Ω	560KΩ	3.3KΩ	1.4 Meg.	0Ω	120KΩ	22Ω	22Ω
8	6SN7	15KΩ	120KΩ	1.5KΩ	200KΩ	120KΩ	1.5KΩ	22Ω	22Ω
9	6V6GT	0Ω	22Ω	220Ω	20KΩ	235KΩ	INF.	22Ω	220Ω
10	6V6GT	0Ω	22Ω	220Ω	20KΩ	270KΩ	165KΩ	22Ω	220Ω
11	5U4G	INF.	20KΩ	220Ω	460Ω	INF.	520Ω	INF.	20KΩ

‡TAKEN WITH VACUUM TUBE VOLTMETER.

#READ 6.5VAC BETWEEN FILAMENT PINS OF TUBES 7, 8, 9 & 10.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

‡ VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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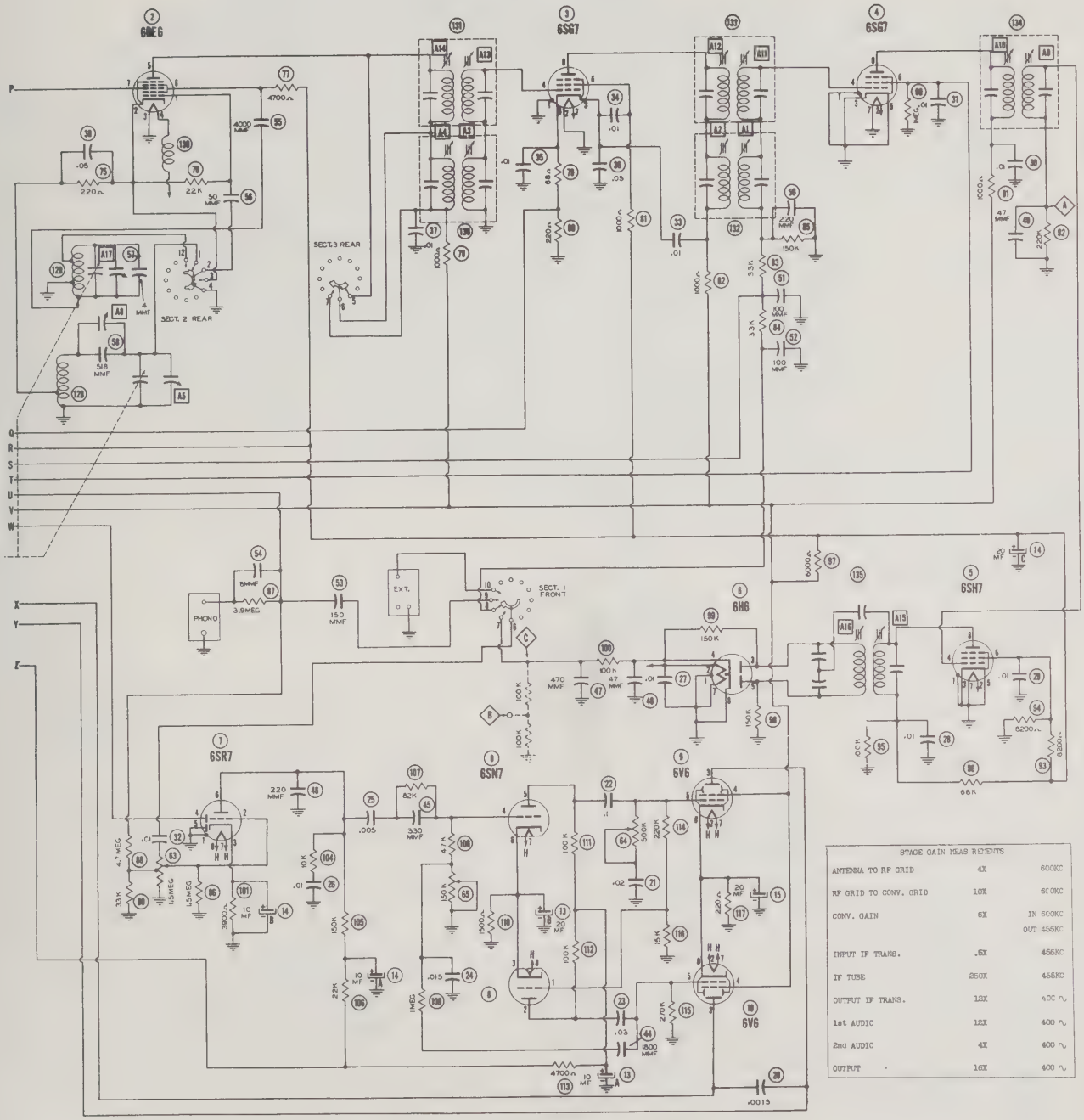

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial.

Use insulated alignment screwdriver for all adjustments.

AM ALIGNMENT

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to rear stator of tuning cap. Low side to chassis.	455KC	BC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output
2	200MMFD	High side to AM ant. terminal. Low side to chassis.	1400KC	"	1400KC	"	A5	" " " "
3	200MMFD	"	"	"	Tune for maximum output.	"	A6,A7	Turn loop ant. switch (142) to ant. position. Adjust for maximum output.
4	200MMFD	"	600KC	"	"	"	A8	Rock tuning cap. and adjust for maximum output. Repeat Steps 2, 3 and 4 until no further improvement can be made.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two 100KΩ resistors in series from Point Ⓒ to chassis. The junction of these resistors is Point Ⓑ. These resistors must be within 1% of each other.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5	.01 MFD.	High side to Pin 4 (grid) of 6SG7 2nd IF Tube (4). Low side to chassis.	10.7MC (Unmodulated)	FM	Tuning cap. fully open.	DC probe to Point Ⓐ. Common to chassis	A9,A10	Adjust for maximum deflection.
6	.01 MFD.	High side to Pin 4 (grid) 6SG7 1st IF Tube (3). Low side to chassis.	"	"	"	"	A11,A12	"
7	.01 MFD	High side to Pin 7 (grid) of 6BE6. Low side to chassis.	"	"	"	"	A13,A14	"
8	.01 MFD	High side to Pin 4 (grid) 6SG7 2nd IF Tube (4). Low side to chassis.	"	"	"	DC probe to Point Ⓑ Common to chassis	A15	"
9	.01 MFD	"	"	"	"	DC probe to Point Ⓒ. Common to chassis	A16	Adjust for zero deflection. Continue with RF Alignment in Step 10.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use freq. modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
5	.01 MFD	High side to Pin 4 (grid) of 6SG7 1st IF Tube (3). Low side to chassis.	10.7MC (Freq. Mod.)	FM	Tuning cap. fully open.	Vertical input to Point Ⓐ. Ground to chassis.	A9,A10 A11,A12	Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1.
6	.01 MFD	Disconnect lead to Pin 7 (grid) of 6BE6. Shunt 100KΩ resistor from Pin 7 to chassis. High side of sig.gen. to Pin 7. Low side to chassis.	"	"	"	"	A13,A14	Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. Remove 100KΩ resistor from Pin 7 of 6BE6 and replace lead to Pin 7.
7	.01 MFD	High side to Pin 4 (grid) of 6SG7 1st IF Tube (3). Low side to chassis.	"	"	"	Vertical input to Point Ⓒ. Ground to chassis.	A15, A16	Alternately and adjust A15 for maximum amplitude and A16 for maximum straightness of crossover lines with crossover occurring at center of pattern per Fig. 2. Continue with RF Alignment in Step 10.

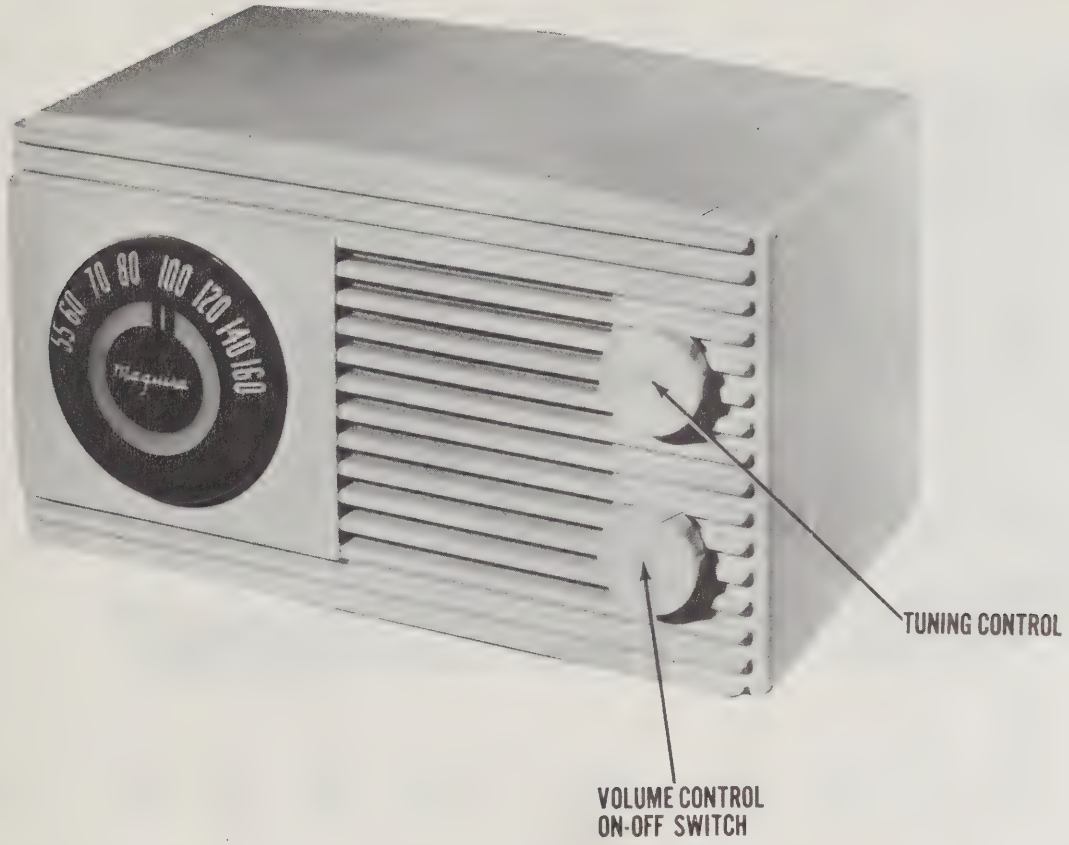
RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
10	300Ω carbon res.	High side to one FM ant. terminal. Low side to other FM ant. terminal.	108MC (Unmodulated)	FM	108MC	DC probe to Point Ⓐ. Common to chassis	A17	Adjust for maximum deflection.
11	"	"	"	"	Tune for maximum deflection.	"	A18,A19	Adjust for maximum deflection. Reassemble receiver in cabinet.
12		Loop	1400KC	BC	Tune for maximum volume.		A20	Turn ant. switch (142) to loop position. Fashion loop of several turns of wire and radiate signal into loop of receiver and adjust A20 for maximum volume.

FIG. 1

FIG. 2

MAGUIRE MODEL
571



MAGUIRE MODEL
571

MAGUIRE MODEL 571

TRADE NAME	Maguire, Model 571
MANUFACTURER	Maguire Industries Inc., W. Putnam, Greenwich, Conn.
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types, 12BE6 Converter, 12SG7 or 12BA6 IF Amp., 12AT6 Det.-AVC-AF, 50B5 Power Output, 35W4 Rectifier.
POWER SUPPLY	110-120 Volts AC-DC
TUNING RANGE—BROADCAST	540-1600KC RATING .23 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer horizontally to the left.

In Step 2 for calibration purposes at 1400KC slip receiver in cabinet. Tune receiver to 1400KC calibration mark and without changing dial setting remove chassis and continue with alignment.

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to rear stator of tuning cap. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2	200MMFD.	High side to ext. ant. lead. Low side to B-.	1400KC	(See prealignment notes).	"	A5	Adjust for maximum output. The trimmer opposite A5 is a factory adjustment and ordinarily need not be adjusted.
3	200MMFD.	"	"	Tune for maximum output.	"	A6	Adjust for maximum output.

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DATE 8/48-#4814-10 SET #44-FOLDER #10

PARTS LIST AND DESCRIPTIONS

MAGUIRE MODEL 571

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MAGUIRE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12BE6	12BE6	7CH	
2A	IF Amp.	12SG7	12SG7	8BK	
B	" "	12BA6	12BA6	7BK	
3	Det.-AVC-AF	12AT6	12AT6	7BT	
4	Power Output	50B5	50B5	7BZ	
5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MAGUIRE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	50	150		PRSA150/30-50	EDL5315	DSB-5030-150	TA-530	Filter-Red
B	30	150						" -Blue
7	.05	400		484-05	DT4S5	ST-4-05	TC-15	Line Filter
8	.01	400		484-01	DT4S1	ST-4-01	TC-11	Output Plate Bypass
9	.01	400		484-01	DT4S1	ST-4-01	TC-11	Audio Coupling
10	.001	600		684-001	DT6D1	ST-6-001	TC-21	" "
11	.05	400		484-05	DT4S5	ST-4-05	TC-15	AVC Filter
12	.1	400		484-.1	DT4P1	ST-4-1	72P2	Line Isolation
13A	125		05353	1468-0001	5W5T1	MO.5-31	1FM-31	Output Grid Bypass
B	125			1468-0001	5W5T1	MO.5-31	1FM-31	Diode RF Filter
14	125			1468-0001	5W5T1	MO.5-31	1FM-31	Osc. Grid Cap.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MAGUIRE PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
15	500KΩ	½				Volume Control & Sw.

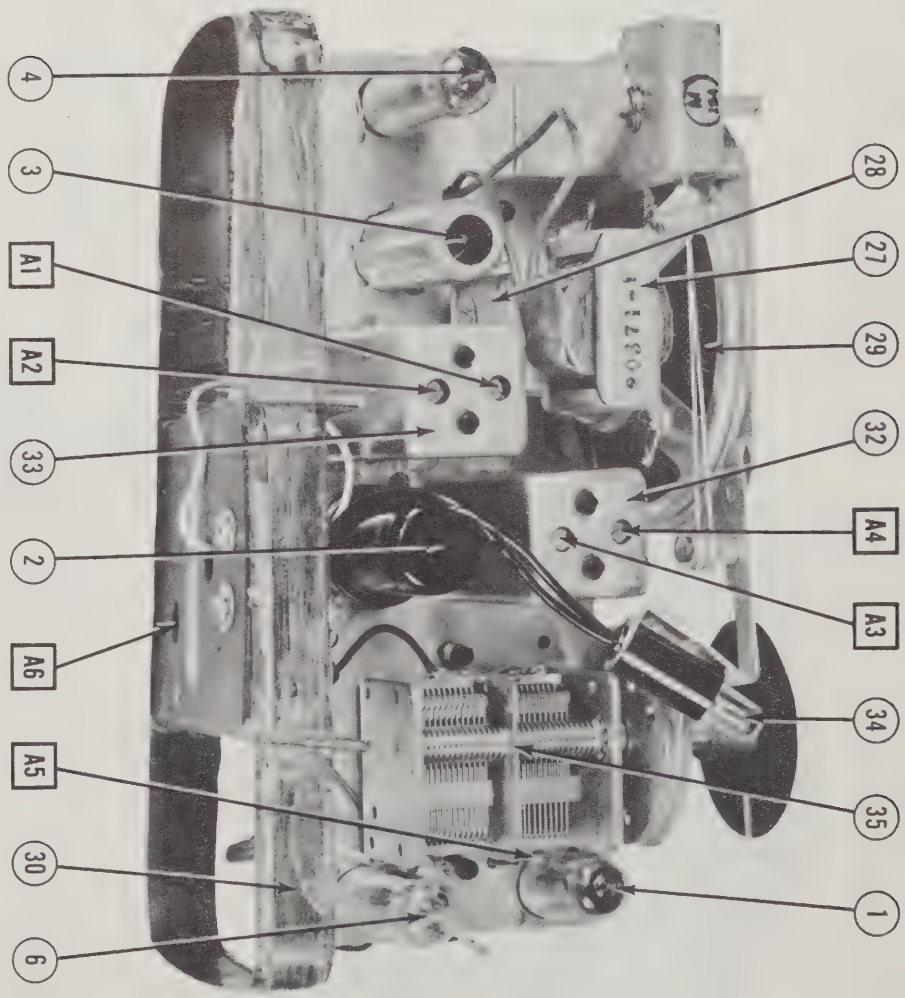
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MAGUIRE PART No.	IRC PART No.	IDENTIFICATION CODES
16	22KΩ	½		BTS-22K	Red-Red-Or. Osc. Grid
17	15 Meg.	½		BTS-15 Meg.	Br.-Grn.-Blue Osc. Grid
18	120Ω	½		BW-½-120	Br.-Red-Br. IF Cathode
19	2.2 Meg.	½		BTS-2.2 Meg	Red-Red-Grn. AVC Network
20	100KΩ	½		BTS-100K	Br.-Blk.-Yl. IF Trans. Shunt
21	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue AF Grid
22	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. AF Plate Load
23	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
24	150Ω	½		BW-½-150	Br.-Grn.-Br. Output Cathode
25	1500Ω	2		BT-2-1500	Br.-Grn.-Red Filter
26	27Ω	½		BW-½-27	Red-Vi.-Blk. Rectifier Ballast

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: MAGUIRE PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	INSTALLATION NOTES
27	1350Ω	2.8Ω	200Ω	.4Ω	20371-1	A-3856#	T22845#	A-2928#	#Bend mounting tabs down, file out slots and mount on original brackets.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: MAGUIRE PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
28	FIELD PM	VC IMP. 2.8Ω	20354-1	ST-113* Mod. P4-X	4A07*	*Fabricate new mounting bracket.
29	CONE DIA. 4"	VC DIA. 1/2"				

R F COILS

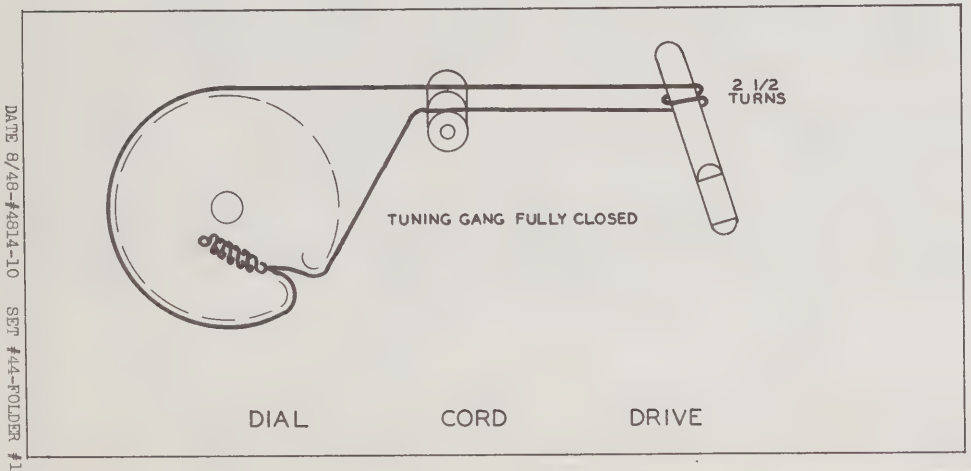
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: MAGUIRE PART No.	MEISSNER PART No.	
30	Loop Ant.	.1Ω	2.2Ω	05346		
31	Osc. Coil	.6Ω	4.8Ω	05348†	14-1060	†Includes Item #14 coupling capacitor.
32	Input IF	23.8Ω	23.8Ω	03964	16-6658	
33	Output IF	30.2Ω	30.2Ω	03965	16-6660	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: MAGUIRE PART No.		INSTALLATION NOTES
34	Bayonet	6-8	0.15	Brown			Type 47

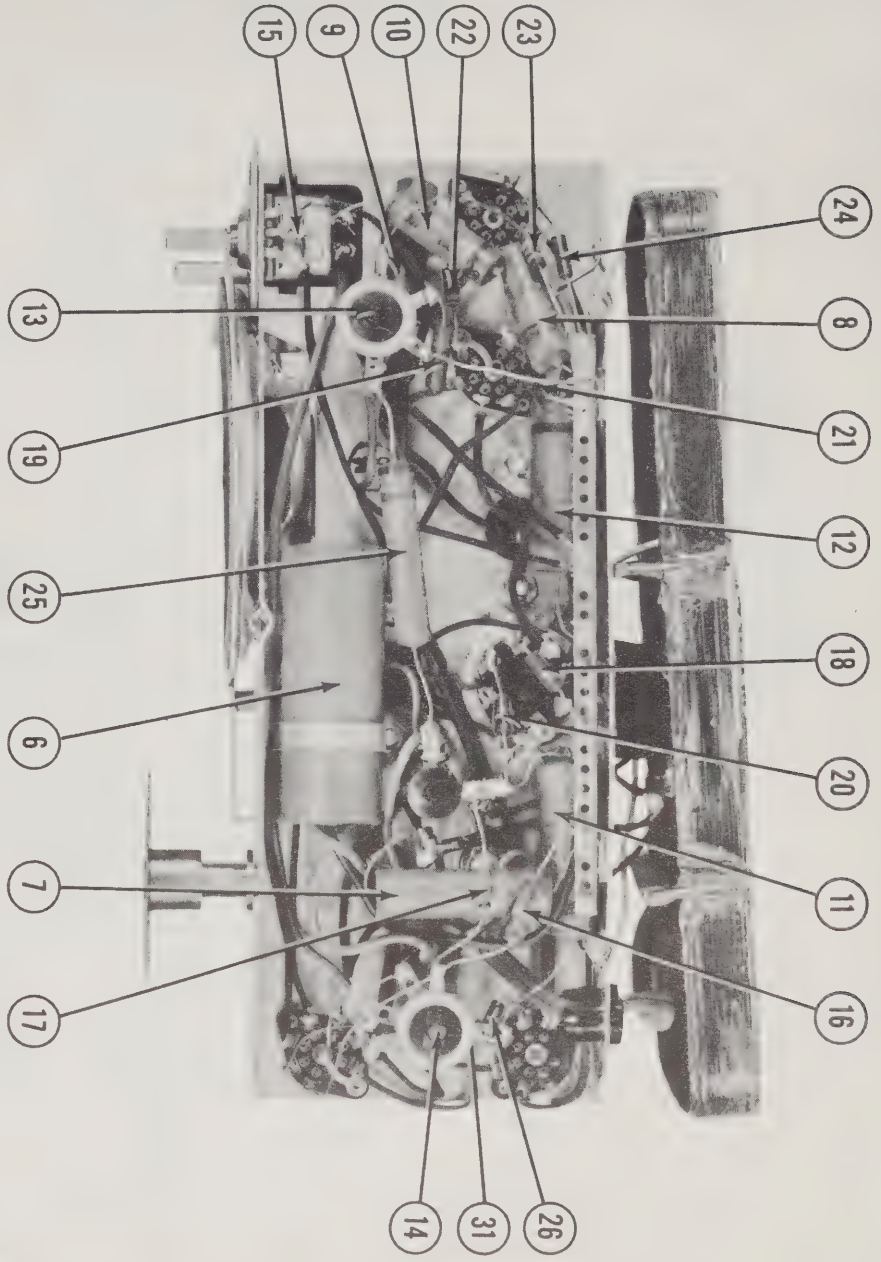
MISCELLANEOUS

ITEM No.	PART NAME	MAGUIRE PART No.	NOTES
35	2 Gang Var. Cap.		(15-453MMF, 35-202MMF)



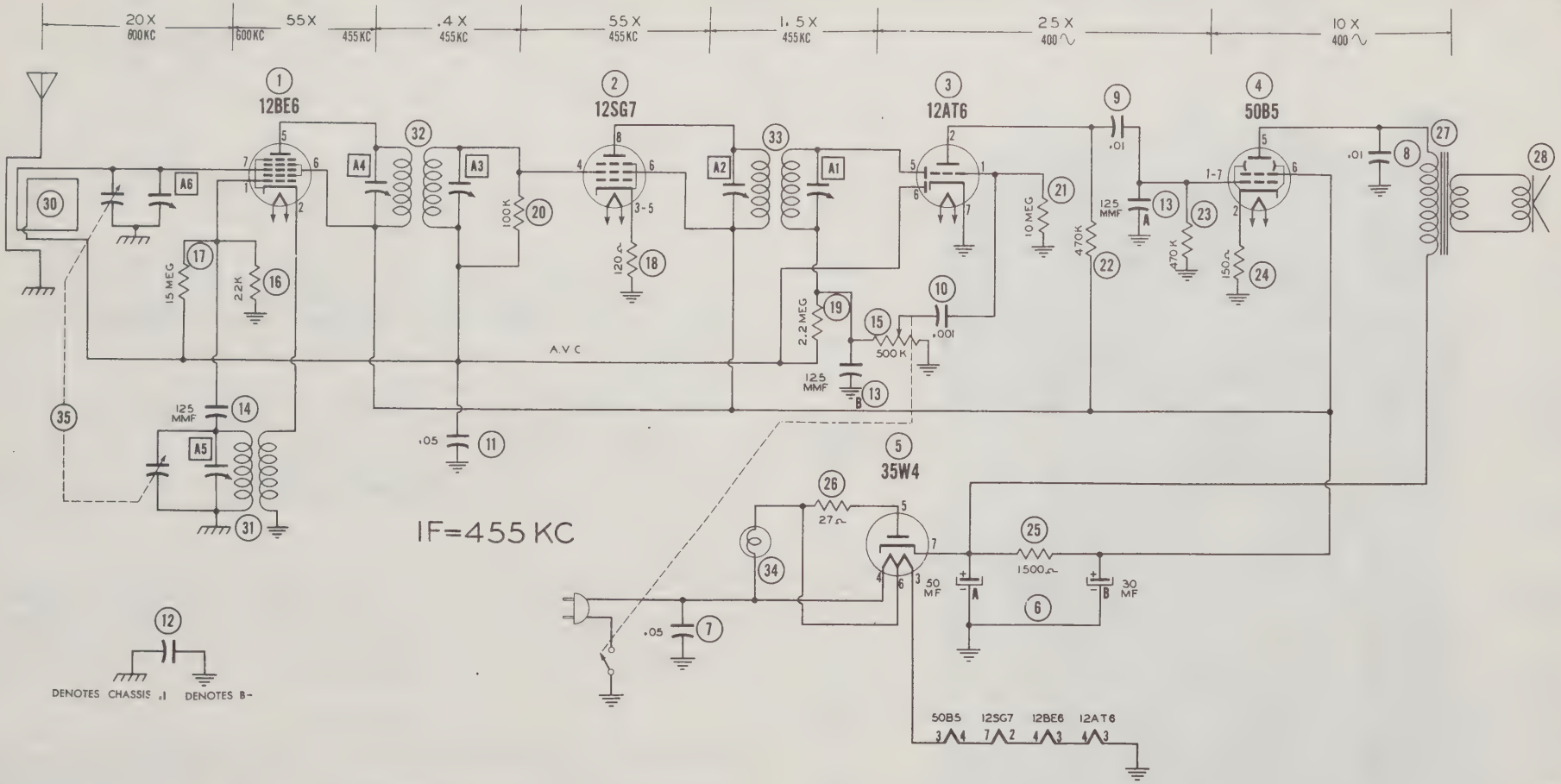
DATE 8/48-#4814-10 SET #44-FOLDER #10

CHASSIS—BOTTOM VIEW



MAGUIRE MODEL 571

MAGUIRE MODEL 571



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12BE6	-7.6VDC§	0V.	11VAC	22VAC	90VDC	90VDC	-.4VDC	-
2	12SG7	0V.	22VAC	.6VDC	-.4VDC	.6VDC	90VDC	36VAC	90VDC
3	12AT6	-.4VDC	0V.	0V.	11VAC	-.4VDC	-.4VDC	45VDC	-
4	50B5	0V.	2.8VDC	80VAC	36VAC	110VDC	90VDC	0V.	-
5	35W4	0V.	0V.	80VAC	117VAC	100VAC	110VAC	115VDC	-

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12BE6	22KΩ	.6Ω	13Ω	25Ω	110KΩ	110KΩ	2.7 Meg.	-
2	12SG7	INF.	25Ω	120Ω	2.8 Meg.	120Ω	110KΩ	38Ω	110KΩ
3	12AT6	10KΩ	0Ω	0Ω	13Ω	500KΩ	2.7 Meg.	580KΩ	-
4	50B5	470KΩ	150Ω	85Ω	38Ω	110KΩ	110KΩ	470KΩ	-
5	35W4	INF.	INF.	85Ω	120Ω	130Ω	110Ω	110KΩ	-

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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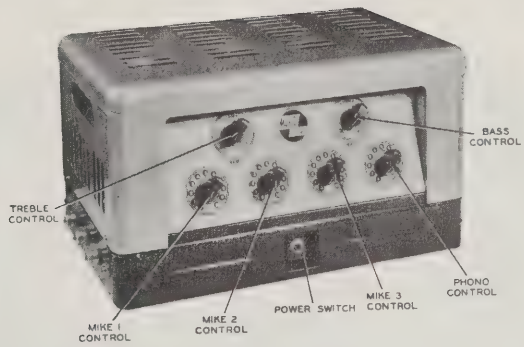
4814-10

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



MASCO MODEL MA-35N

TRADE NAME	Masco, Model MA-35N
MANUFACTURER	Mark Simpson Mfg. Co., Inc., 32-28 49th St., Long Island City, N.Y.
TYPE SET	AC Operated 4 Channel Audio Amplifier
TUBES (ELEVEN)	Types, (3) 6J7 Mic. Amp., 6SC7 Mixer AF Amp., 6SN7GT AF Phase Inv., 6SN7GT AF Amp., 6SN7GT Driver, (2) 6L6G Power Output, 6X5GT Bias Rectifier, 5U4G Rectifier.
POWER SUPPLY	105-125 Volts AC RATING 1.4 Amp. @ 117 Volts AC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	6J7	0V.	-36VDC	39VDC	34VDC	0V.	0V.	-36VDC	0V.	0V.
2	6J7	0V.	-36VDC	22VDC	17VDC	0V.	0V.	-36VDC	0V.	0V.
3	6J7	0V.	-36VDC	21VDC	18VDC	0V.	0V.	-36VDC	0V.	0V.
4	6SC7	0V.	90VDC	0V.	-.1VDC	90VDC	1VDC	-36VDC	-36VDC	-
5	6SN7GT	0V.	25VDC	1.1VDC	-.2VDC	27VDC	1VDC	-36VDC	-36VDC	-
6	6SN7GT	0V.	133VDC	5VDC	0V.	133VDC	5VDC	-36VDC	-36VDC	-
7	6SN7GT	-28VDC	290VDC	-26VDC	-28VDC	290VDC	-26VDC	-36VDC	-36VDC	-
8	6L6G	0V.	-36VDC	360VDC	290VDC	-26VDC	360VDC	-36VDC	0V.	-
9	6L6G	0V.	-36VDC	360VDC	290VDC	-26VDC	360VDC	-36VDC	0V.	-
10	6X5GT	0V.	-36VDC	-52VDC	0V.	-52VDC	-36VDC	-36VDC	80VAC	-
11	5U4G	0V.	370VDC	0V.	345VAC	0V.	345VAC	0V.	370VDC	-

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	6J7	0Ω	750Ω	260KΩ	630KΩ	0Ω	INF.	750Ω	0Ω	15 Meg.
2	6J7	0Ω	750Ω	260KΩ	630KΩ	0Ω	INF.	750Ω	0Ω	15 Meg.
3	6J7	0Ω	750Ω	260KΩ	630KΩ	0Ω	INF.	750Ω	0Ω	15 Meg.
4	6SC7	0Ω	160KΩ	150KΩ	150KΩ	160KΩ	1000Ω	750Ω	750Ω	-
5	6SN7GT	10KΩ	160KΩ	1000Ω	270KΩ	160KΩ	1000Ω	750Ω	750Ω	-
6	6SN7GT	100KΩ	60KΩ	1000Ω	110KΩ	60KΩ	1000Ω	750Ω	750Ω	-
7	6SN7GT	270KΩ	10KΩ	1700Ω	270KΩ	10KΩ	1700Ω	750Ω	750Ω	-
8	6L6G	0Ω	750Ω	11KΩ	10KΩ	1700Ω	11KΩ	750Ω	0Ω	-
9	6L6G	0Ω	750Ω	11KΩ	10KΩ	1700Ω	11KΩ	750Ω	0Ω	-
10	6X5GT	INF.	750Ω	1000Ω	INF.	1000Ω	750Ω	750Ω	7Ω	-
11	5U4G	INF.	11KΩ	INF.	30Ω	INF.	32Ω	INF.	11KΩ	-

1.- DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a varitaion of ± 15% in voltage and resistance readings.
6 - All control at minimum, proper output load connected.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		MASCO PART No.	STANDARD REPLACEMENT		
1	Mic. Amp.		6J7	7R	
2	Mic. Amp.		6J7	7R	
3	Mic. Amp.		6J7	7R	
4	Mixer AF Amp.		6SC7	8S	
5	AF Phase Inv.		6SN7GT	8BD	
6	AF Amp.		6SN7GT	8BD	
7	Driver		6SN7GT	8BD	
8	Power Output		6L6G	7AC	
9	Power Output		6L6G	7AC	
10	Bias Rectifier		6X5GT	6S	
11	Rectifier		5U4G	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

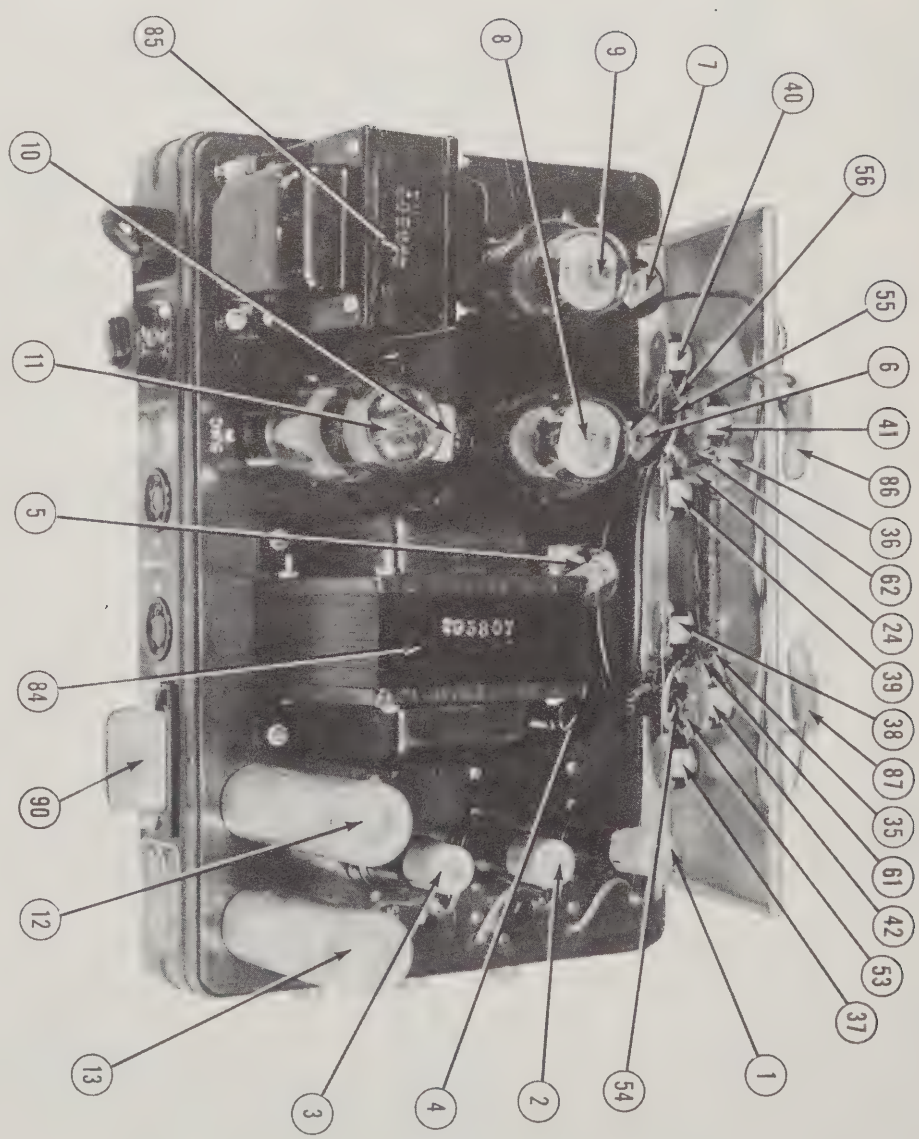
ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	MASCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	
12	8	600		GL600/8	KR608	D-8-600	AP-86	Filter - Red
13	8	600		GL600/8	KR608	D-8-600	AP-86	" - "
14A	8	450		PRS450/8-8	EZ8845	DH-2x8-450	UT-88	" - "
B	8	450						"
15	16	450		PRS450/16	BR1645	M-16-450	UT-16	"
16	16	450		PRS450/16	BR1645	M-16-450	UT-16	Mixer Plate Decoupling
17	8	450		PRS450/8	BR845	M-8-450	UT-4	Mic. Amp. Decoupling
18	50	50		PRS50/50	BR505	M-50-50	TA-550	Bias Filter
19	10	50		PRS50/10	BR105	M-10-50	TA-510	" "
20	.1	600		684-.1	DT6P1	ST-6-1	TC-1	Audio Coupling
21	.1	600		684-.1	DT6P1	ST-6-1	TC-1	" "
22	.1	600		684-.1	DT6P1	ST-6-1	TC-1	" "
23	.1	600		684-.1	DT6P1	ST-6-1	TC-1	" "
24	.005	600		684-005	DT6D5	ST-6-005	TC-25	Tone Comp.
25	.1	600		684-.1	DT6P1	ST-6-1	TC-1	Audio Coupling
26	.01	600		684-01	DT6S1	ST-6-01	TC-11	" "
27	.01	600		684-01	DT6S1	ST-6-01	TC-11	" "
28	.01	600		684-01	DT6S1	ST-6-01	TC-11	" "
29	.1	600		684-.1	DT6P1	ST-6-1	TC-1	Mic. Amp. Screen Bypass
30	.1	600		684-.1	DT6P1	ST-6-1	TC-1	" " " "
31	.1	600		684-.1	DT6P1	ST-6-1	TC-1	" " " "
32	.005	600		684-005	DT6D5	ST-6-005	TC-25	Audio Coupling
33	.005	600		684-005	DT6D5	ST-6-005	TC-25	" "
34	.005	600		684-005	DT6D5	ST-6-005	TC-25	" "
35	500	500		1468-0005	5W5T5	MO.5-35	1FM-35	Tone Comp.
36	500	500		1468-0005	5W5T5	MO.5-35	1FM-35	" "

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	MASCO PART No.	IRC PART No.	CLAROSTAT PART No.	
37A	500KΩ	½		D13-133	M-60-Z	Mike 1 Control
B	Shaft			A	Not Req.	Attach to 37A per instructions
38A	500KΩ	½		D13-133	M-60-Z	Mike 2 Control
B	Shaft			A	Not Req.	Attach to 38A per instructions
39A	500KΩ	½		D13-133	M-60-Z	Mike 3 Control
B	Shaft			A	Not Req.	Attach to 39A per instructions
40A	500KΩ	½		D13-133	M-60-Z	Phono Control
B	Shaft			A	Not Req.	Attach to 40A per instructions
41A	500KΩ	½		D13-133	M-60-Z	Bass Control
B	Shaft			A	Not Req.	Attach to 41A per instructions
42A	500KΩ	½		D13-133	M-60-Z	Treble Control
B	Shaft			A	Not Req.	Attach to 42A per instructions
43	50Ω	1		W-50	43-50	Hum Bal. Control-See Note

Note-Use insulating washers to isolate control from chassis.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	MASCO PART No.	IRC PART No.	
44	15 Meg.	½		BTS-15 Meg.	Br.-Grn.-Blue 1st Mic. Amp. Grid
45	15 Meg.	½		BTS-15 Meg.	Br.-Grn.-Blue 2nd Mic. Amp. Grid
46	15 Meg.	½		BTS-15 Meg.	Br.-Grn.-Blue 3rd Mic. Amp. Grid
47	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. 1st Mic. Amp. Screen Dropping
48	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. 2nd Mic. Amp. Screen Dropping
49	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. 3rd Mic. Amp. Screen Dropping
50	100KΩ	½		BTS-100K	Br.-Blk.-Yl. 1st Mic. Amp. Plate Load
51	100KΩ	½		BTS-100K	Br.-Blk.-Yl. 2nd Mic. Amp. Plate Load
52	100KΩ	½		BTS-100K	Br.-Blk.-Yl. 3rd Mic. Amp. Plate Load
53	270KΩ	½		BTS-270K	Red-Vi.-Yl. Isolation
54	270KΩ	½		BTS-270K	Red-Vi.-Yl. "
55	270KΩ	½		BTS-270K	Red-Vi.-Yl. "
56	270KΩ	½		BTS-270K	Red-Vi.-Yl. "
57	1000Ω	½		BTS-1000	Br.-Blk.-Red Mixer Cathode
58	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Mixer Plate Load
59	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Mixer Plate Decoupling-See Note
60	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Mic. Amp. Decoupling
61	270KΩ	½		BTS-270K	Red-Vi.-Yl. Tone Compensation
62	27KΩ	½		BTS-27K	Red-Vi.-Or. " "
63	1000Ω	½		BTS-1000	Br.-Blk.-Red 1st AF Cathode
64	100KΩ	½		BTS-100K	Br.-Blk.-Yl. 1st AF Plate Load
65	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Phase Inverter Plate Load
66	1000Ω	½		BTS-1000	Br.-Blk.-Red Phase Inverter Cathode
67	10KΩ	½		BTS-10K	Br.-Blk.-Or. Phase Inverter Grid
68	100KΩ	½		BTS-100K	Br.-Blk.-Yl. 2nd AF Grid
69	1000Ω	½		BTS-1000	Br.-Blk.-Red 2nd AF Cathode
70	100KΩ	½		BTS-100K	Br.-Blk.-Yl. 3rd AF Grid
71	47KΩ	½		BTS-47K	Yl.-Vi.-Or. 2nd AF Plate Load
72	47KΩ	½		BTS-47K	Yl.-Vi.-Or. 3rd AF Plate Load
73	270KΩ	½		BTS-270K	Red-Vi.-Yl. 1st Driver Grid
74	270KΩ	½		BTS-270K	Red-Vi.-Yl. 2nd Driver Grid
75	18Ω	½		BW-½-18	Br.-Gray-Blk. Parasitic Suppressor
76	18Ω	½		BW-½-18	Br.-Gray-Blk. " "
77	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Decoupling
78	4700Ω	½		BTS-4700	Yl.-Vi.-Red "
79	1250Ω	10		AB-1250	Filter
80	10KΩ	20		DG-10K	Bleeder
81	250Ω	10		AB-250	Bias Filter
82	750Ω	10		AB-750	Bias Bleeder

Note-Some models use 47KΩ in this application. Replacement same as #57.

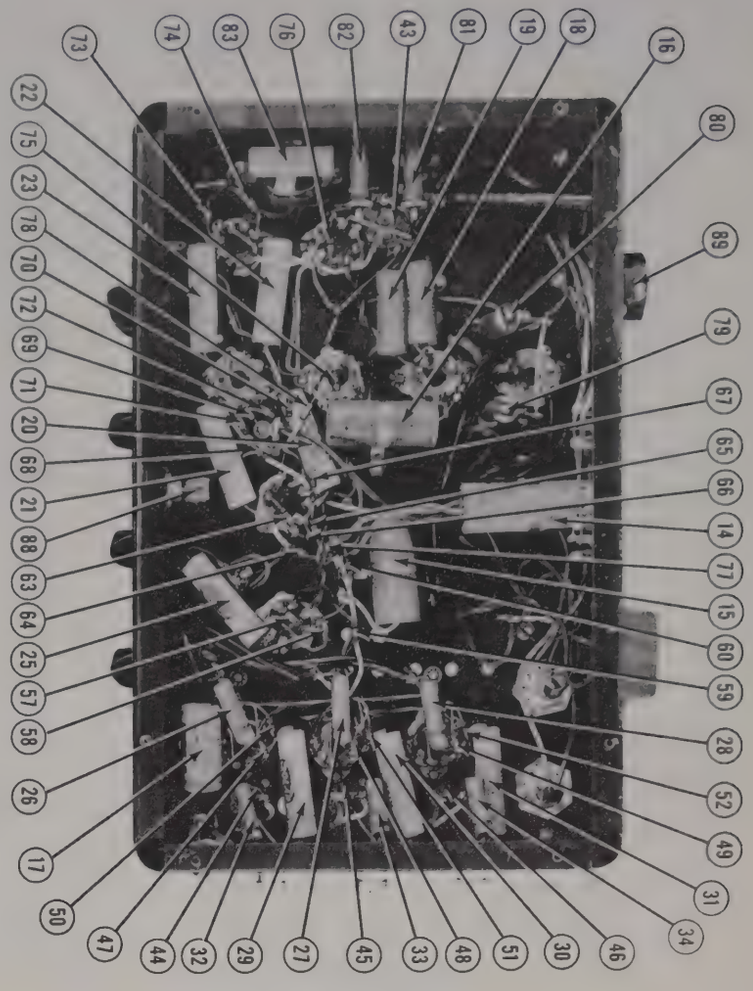
TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	MASCO PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
83	117V AC @ 1.4A	690V CT .155A DC tapped @ 80V .072ADC	5.3V AC @ 3.0A	6.4VAC @ 5.7A	P-35			P-3156

(DRIVER) CHOKE

ITEM NO.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	MASCO PART NO.	STANCOR PART NO.	THORDARSON PART NO.	MERIT PART No.	
84	10MA per side	1900Ω CT	45 Henries	CD-5				

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MASCO PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
85	4000Ω CT	4Ω 8Ω 15Ω 125Ω 250Ω 500Ω	175Ω CT	.4Ω .5Ω .6Ω 12Ω 18Ω 26Ω	T-35	A-3851*	T22870*	A-3131	*Drill new mounting holes.

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					MASCO PART No.		
86	Bayonet	6-8	0.25	Blue			Type 44
87	"	6-8	0.25	"			" "

MISCELLANEOUS

ITEM No.	PART NAME	MASCO PART No.	NOTES
88	Switch		On-Off
89	"		Impedance Selector
90	Fuse		3 Amp.

SPEAKERS

1. (a) This amplifier is designed for use with PM speakers or PM re-entrant horns only. If electro-dynamic speakers are to be used a separate exciter supply must be employed.

   (b) Determine the number of speakers required and select the desired types. Make sure that the sum of the power ratings of the speakers selected is approximately equal to the rated output of the amplifier, namely 35 watts. For example: If the speakers are rated at 5 watts each, 7 speakers are required for a 35 watt amplifier.

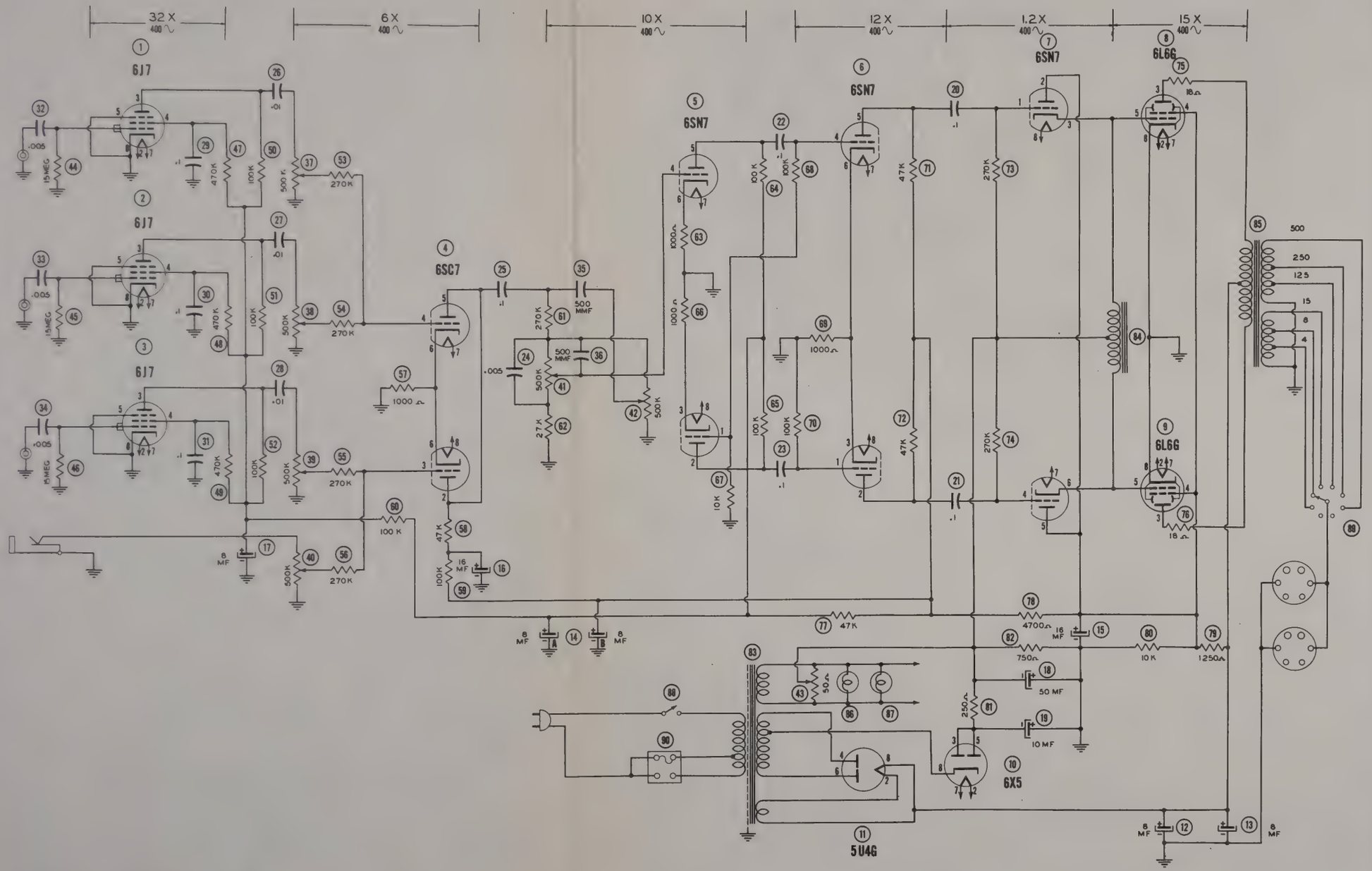
2. (a) Connect the speakers or speaker lines to the output sockets through the use of one or two six-prong plugs. Pins #2 & #5 of the plugs should be used for the connections. Note that both output sockets are internally connected in parallel.

   (b) For running voice coil cables use wire #18 or heavier, twisted or parallel. For cable lengths exceeding 75 feet use the "line" impedance taps and employ "line" matching transformers on the speakers.

3. Select the proper output impedance by rotating the impedance selector until the desired impedance tap is visible through the small opening in the selector.

   DO NOT ROTATE THE SELECTOR WHILE THE AMPLIFIER IS OPERATING.

   The proper impedance tap to be used is determined by the impedance of the speakers, the number of speakers or lines and method of connection. The tap setting for speakers (or lines) of the same impedance connected in parallel is equal to the impedance of one speaker or line divided by the total number of such speakers (or lines). Thus two 15 ohm trumpet speakers in parallel should be connected to 15/2 = 7½ ohms (use 8 ohm setting). Similarly two 500 ohm lines in parallel are connected to 250 ohms. In series operation of equal impedances the net impedance is equal to the impedance of one speaker or line times the total number. Thus four 4 ohm speakers in series equal 16 ohms (use 15 ohm tap).



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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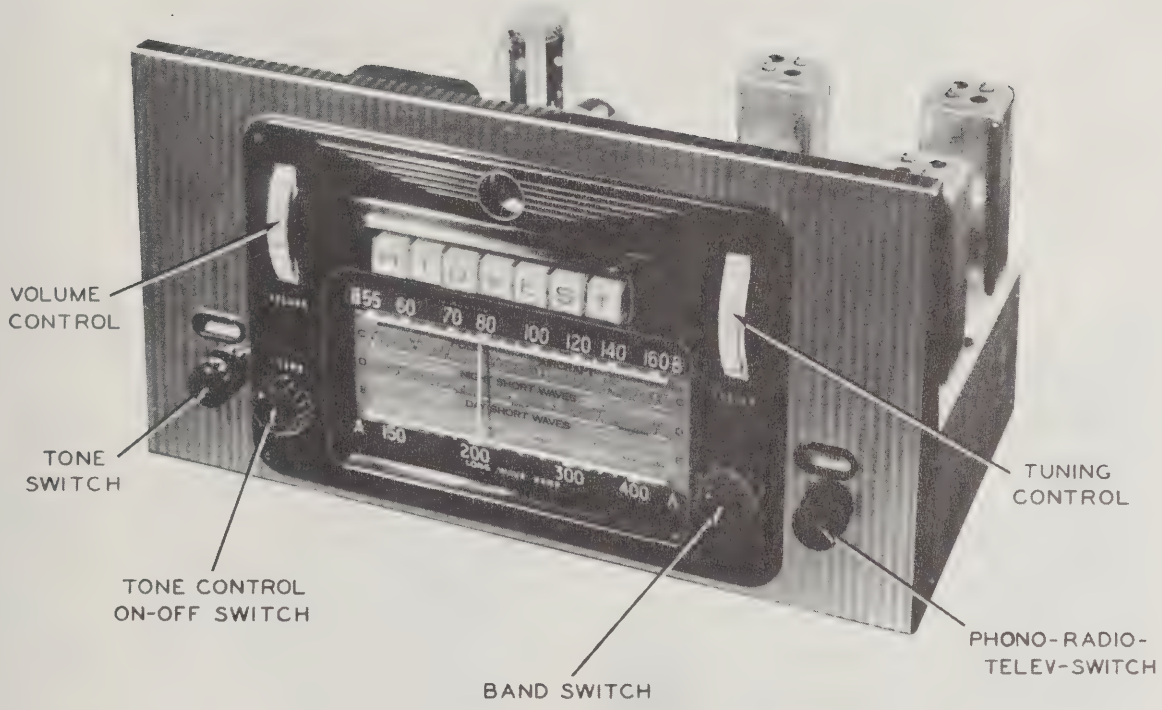
4814-11

MIDWEST MODELS R-12,
RG-12, RT-12 (Ch. RGL-12)



MIDWEST MODELS R-12,
RG-12, RT-12 (Ch. RGL-12)

TRADE NAME	Midwest, Models R-12, RG-12, RT-12 (Ch. RGL-12)		
MANUFACTURER	Midwest Radio Corp., 909 Broadway, Cincinnati 2, Ohio		
TYPE SET	AC Operated Five Band Superheterodyne Receiver with Loop Antenna		
TUBES (TWELVE)	Types, 7A7 RF Amp., 7Q7 Converter, 7A7 1st IF Amp., 7A7 2nd IF Amp., 7A6 Det.-AVC, 6U5/6G5 Tuning Eye, 7A4 1st AF Amp., 7A4 2nd AF Amp., 7A4 Phase Inverter, (2) 7C5 Power Output, 5U4G Rectifier.		
POWER SUPPLY	105-125 Volts AC	RATING	.81 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540-1600KC	SHORT WAVE	1.6-4.75MC, 4.7-10.1MC, 10.8-22.1MC
		LONG WAVE	145-420KC

PUSHBUTTON ADJUSTMENTS

1. Turn receiver on and allow it to warm up for at least fifteen minutes.
2. Remove buttons and loosen set screws for each button shaft.
3. Manually tune in station desired to be set up and push in completely any button shaft.
4. Hold button shaft in and tighten set screw firmly.
5. Check accuracy of setting by detuning with the manual tuning control and retuning with pushbutton shaft. If setting is off repeat Steps 3, 4 and 5.
6. Replace button.
7. To set up the remaining buttons follow the same procedure as outlined above.

HOWARD W. SAMS & CO., INC. **Indianapolis Indiana**

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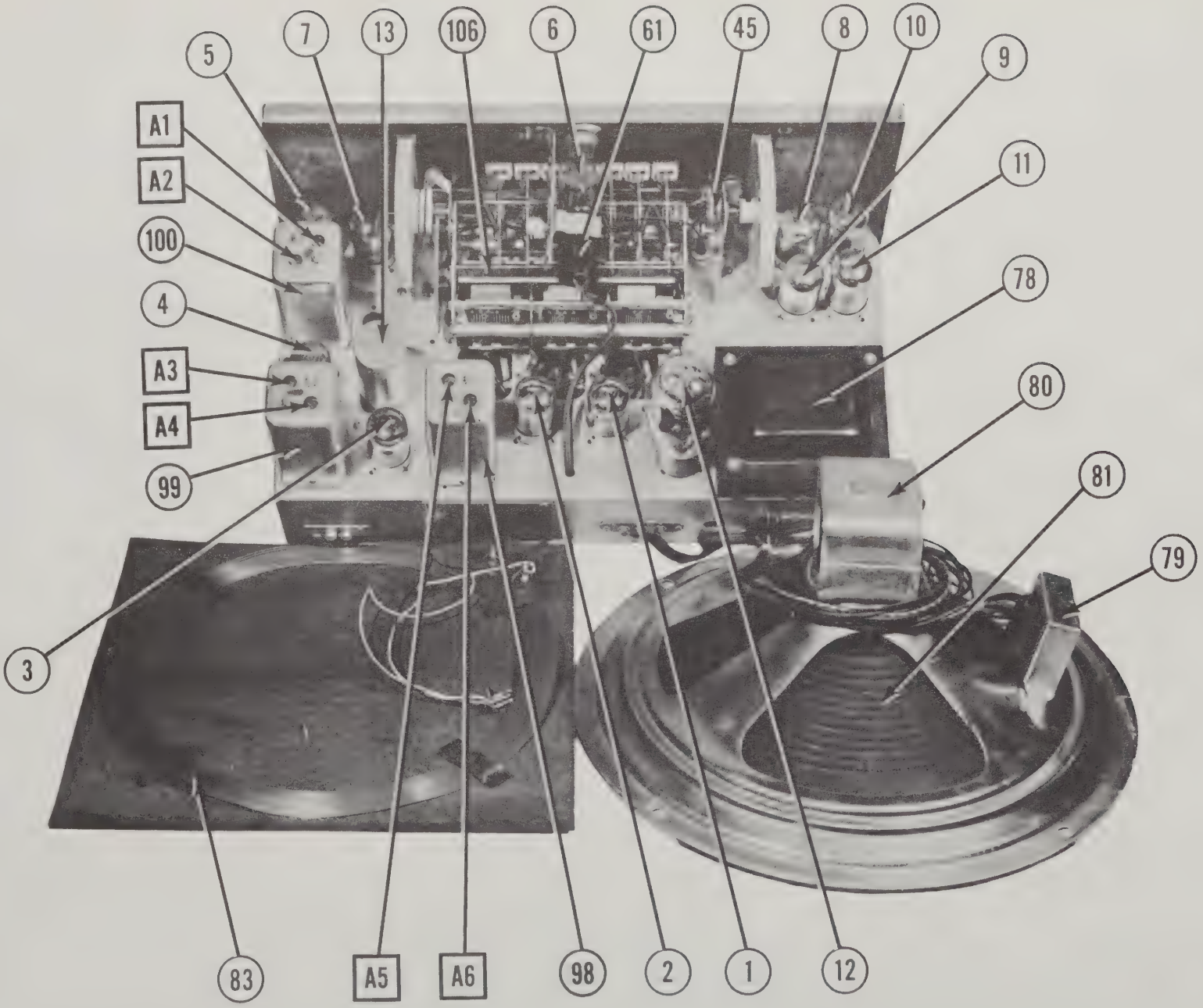
DATE 8/48-#4814-12 SET #44-FOLDER #12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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		MIDWEST PART No.	STANDARD REPLACEMENT		
1	RF Amp.	7A7	7A7	8V	
2	Converter	7Q7	7Q7	8AL	
3	1st IF Amp.	7A7	7A7	8V	
4	2nd IF Amp.	7A7	7A7	8V	
5	Det.-AVC	7A6	7A6	7AJ	
6	Tuning Eye	6U5/6G5	6U5/6G5	6R	
7	1st AF Amp.	7A4	7A4	5AC	
8	2nd AF Amp.	7A4	7A4	5AC	
9	Phase Inverter	7A4	7A4	5AC	
10	Power Output	7C5	7C5	6AA	
11	" "	7C5	7C5	6AA	
12	Rectifier	5U4G	5U4G	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	MIDWEST PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	
13A	40	450	CE-6	AF88J	UP4445	DY-2x40-450	EL-240	◓ Filter
B	40	450						▲ "
14	40	25	CE-4	PRS25/40	BR502	M-50-25	TA-50	Cathode Bypass
15	.01	800		484-01	DT6S1	MPH-6-01	TC-11	Line Filter
16	.01	800		484-01	DT6S1	MPH-6-01	TC-11	" "
17	.05	200		484-05	DT2S5	ST-4-05	TC-15	Feedback
18	.05	200		484-05	DT2S5	ST-4-05	TC-15	"
19	.01	200		484-01	DT2S1	ST-4-01	TC-11	"
20	.01	800		684-01	DT6S1	ST-6-01	TC-11	Audio Coupling
21	.01	800		684-01	DT6S1	ST-6-01	TC-11	" "
22	.01	800		684-01	DT6S1	ST-6-01	TC-11	" "
23	.01	200		484-01	DT2S1	ST-4-01	TC-11	Tone Compensation
24	.01	200		484-01	DT2S1	ST-4-01	TC-11	" "
25	.01	200		484-01	DT2S1	ST-4-01	TC-11	Audio Coupling
26	.01	800		684-01	DT6S1	ST-6-01	TC-11	Screen Decoupling
27	.01	800		684-01	DT6S1	ST-6-01	TC-11	1st IF Screen Bypass
28	.05	200		484-05	DT2S5	ST-4-05	TC-15	AVC Filter
29	.01	800		684-01	DT6S1	ST-6-01	TC-11	Conv. Screen Bypass
30	.01	800		684-01	DT6S1	ST-6-01	TC-11	RF Screen Bypass
31	500	500		1468-0005	5W5T5	MO.5-35	1FM-35	Diode RF Filter
32	75	500		1469-000075				Fixed Padder
33	1050	500						" "
34	75	500		1469-000075				Fixed Trimmer
35	300	500		1469-0003	5R5T3	MOS.5-33	MS-33	Fixed Padder
36	4100	500						Fixed Padder
37	51	500		1469-00005	5R5Q5	MOS.5-45	MS-45	Fixed Trimmer
38	150	500		1469-00015	5R5T15	MOS.5-315	MS-315	Fixed Trimmer
39	100	500		1469-0001	5R5T1	MOS.5-31	MS-31	Fixed Trimmer
40	91	500						Fixed Trimmer
41	200	300		1468-0002	5W5T2	MO.5-32	1FM-32	RF Coupling-Cer.
42	50	300		1469-00005	5R5Q5	MOS.5-45	MS-45	Fixed Trimmer-Cer.
43	130	500						" "
44	91	500						" "
107	510	500		1468-0005	5W5T5	MO.5-35	1FM-35	Tone Comp.
108	.01	800		1084-.01	MD16S1	STM-10-01	TR-11	RF Bypass Power Supply
109	100	500		1469-.0001	5R5T1	MOS.5-31	MS-31	Osc. Grid Cap.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	MIDWEST PART No.	IRC PART No.	CLAROSTAT PART No.	
45	500KΩ	½	RV-6			Volume Control tapped @ 450KΩ
46A	500KΩ	½	RV-5	D11-133	AM-58-S	Tone Control
B	Shaft		Not Req.	E	KSS-3	Attach to 46A per instructions
C	Switch		" "	41	SW-A	" " " " "

PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	MIDWEST PART No.	MEISSNER PART No.	
82	Ant. Coil Band A	125Ω	40Ω	UK-5		Items 82, 84, 85, 86 and 87 are part of complete assembly.
83	Loop Ant.	0Ω	1.3Ω			
84	Loop Load Coil Band		.7Ω	UK-5		
85	Ant. Coil C	.8Ω	.5Ω	UK-5		
86	" " D	.6Ω	0Ω	UK-5		
87	" " E	.2Ω	0Ω	UK-5		
88	RF " A	130Ω	40Ω	UK-6		Items 88, 89, 90, 91 and 92 are part of complete assembly.
89	" " B	87Ω	2.8Ω	UK-6		
90	" " C	.8Ω	.6Ω	UK-6		
91	" " D	.6Ω	0Ω	UK-6		
92	" " E	.4Ω	0Ω	UK-6		
93	Osc. " A	.8Ω	22.2Ω	UK-7		Items 93, 94, 95, 96 and 97 are part of complete assembly.
94	" " B	.2Ω	5.6Ω	UK-7		
95	" " C	.4Ω	.7Ω	UK-7		
96	" " D	.3Ω	.2Ω	UK-7		
97	" " E	0Ω	0Ω	UK-7		
98	Input IF		7Ω	TR-6		
99	Inter. IF		7Ω	TR-6		
100	Output IF		7Ω	TR-7		

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					MIDWEST PART No.		
101	Screw	6-8	0.25	Blue	IL-1		Type 46
102	"	6-8	0.25	"	IL-1		" "

MISCELLANEOUS

ITEM No.	PART NAME	MIDWEST PART No.	NOTES
103	Switch		Band
104	"		Radio-Phono-Telev.
105	"		Tone
106	3 Gang Var. Cap	CV-15-2	(13-505 MMF, 13-505 MMF, 13-350 MMF)
	Dial	AD-8	Glass
	Pointer	AP-21	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	MIDWEST PART No.	IRC PART No.	
47	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. RF Grid
48	82KΩ	½		BTS-82K	Gray-Red-Or. RF Screen
49	20KΩ	½		BTS-22K	Red-Blk.-Or. Osc. Grid
50	22KΩ	2		BT-2-22K	Red-Red-Or. Osc. Screen
51	10Ω	½			Br.-Blk.-Blk. Parasitic Suppressor
52	220Ω	½			Red-Red-Br. 1st IF Cathode
53	470Ω	½		BTS-470	Yl.-Vi.-Br. 1st IF Screen Decoup.
54	220Ω	½			Red-Red-Br. 2nd IF Cathode
55	47KΩ	1		BTA-47K	Yl.-Vi.-Or. Screen Dropping
56	15KΩ	½		BTS-15K	Br.-Grn.-Or. Diode Filter
57	3.3 Meg.	½		BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
58	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Diode Load
59	1.5 Meg.	½		BTS-1.5 Meg.	Br.-Grn.-Grn. AVC Network
60	56KΩ	½		BTS-56K	Grn.-Blue-Or. Diode Load
61	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. Tuning Eye Plate Load
62	12KΩ	½		BTS-12K	Br.-Red-Or. Tone Comp.
63	4700Ω	½		BTS-4700	Yl.-Vi.-Red 1st AF Cathode
64	100KΩ	½		BTS-100K	Br.-Blk.-Yl. 1st AF Plate Load
65	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. 2nd AF Grid
66	100KΩ	½		BTS-100K	Br.-Blk.-Yl. 2nd AF Plate Load
67	4700Ω	½		BTS-4700	Yl.-Vi.-Red 2nd AF Cathode
68	820KΩ	½		BTS-820K	Gray-Red-Yl. Phase Inv. Grid
69	680KΩ	½		BTS-680K	Blue-Gray-Yl. Phase Inv. Grid
70	4700Ω	½		BTS-4700	Yl.-Vi.-Red Phase Inv. Cathode
71	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Phase Inv. Plate Load
72	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
73	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. " "
74	270Ω	3		AB-250	Red-Vi.-Br. Output Cathode
75	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Tone Compensation
76	10KΩ	½		BTS-10K	Br.-Blk.-Or. Feedback
77	270Ω	3		AB-250	Red-Vi.-Br. Surge Limiter

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	MIDWEST PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
78	117VAC @ .81A	620VCT .93ADC	5.2VAC @ 3.0A	6.3VAC @ 4.0A	TP-8	P-6314#	T-22R07#	P-2955#

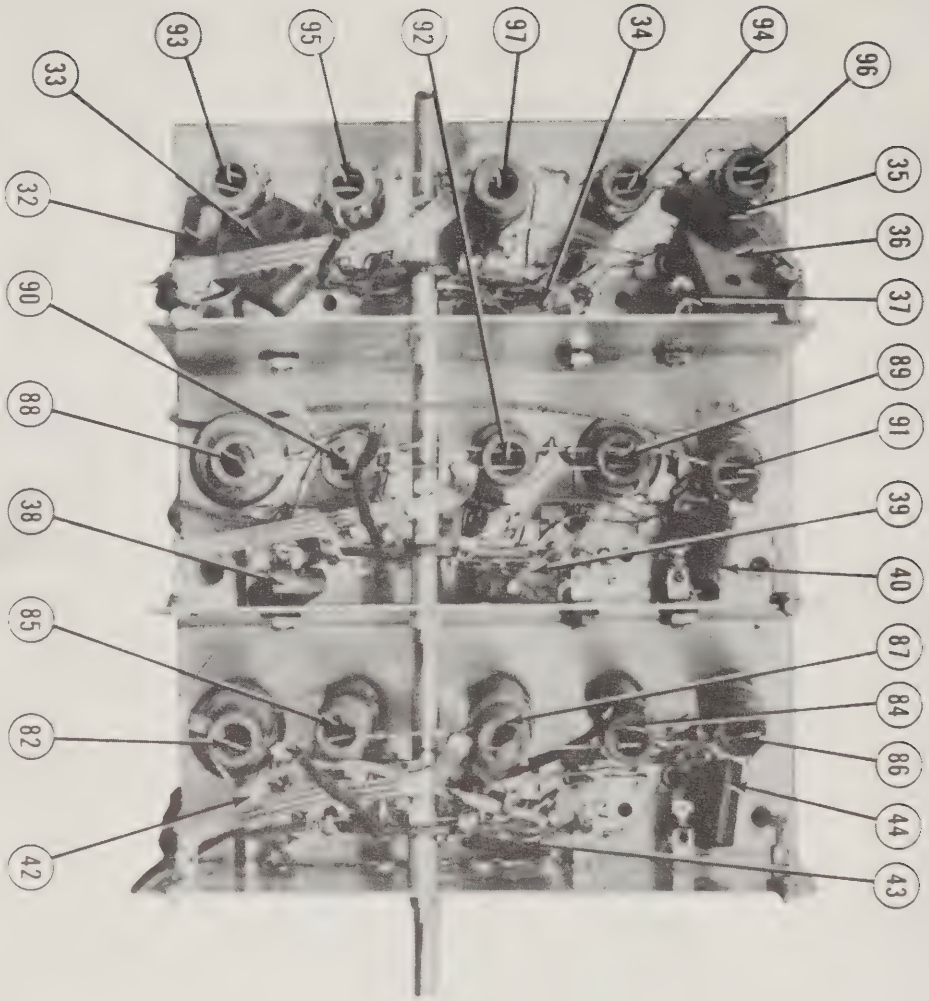
#Add series resistor to reduce plate voltage.

TRANSFORMER (OUTPUT)

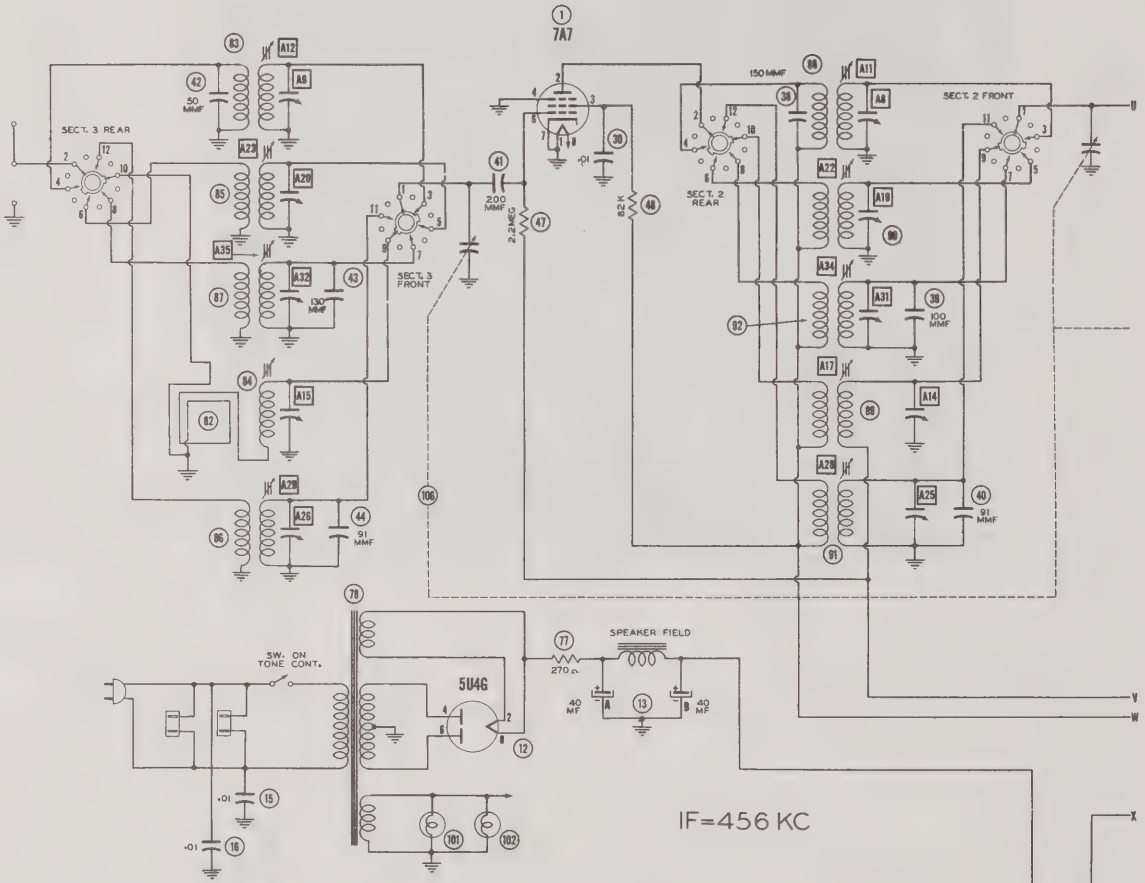
ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MIDWEST PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
79	9000Ω CT	5.0Ω	390Ω CT	.3Ω	Part of SP-2	A-3824	T22S56	A-2904*	*Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
	FIELD	VC IMP.	MIDWEST PART No.	JENSEN PART No.	QUAM PART No.	
80	500Ω	5Ω	SP-2		12E60	
	CONE DIA.	VC DIA.				
81	11½"	1"				



DATE 6/48-#4614-12 SET #44-FOLDER #12



VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	7A7	0V.	260VDC	80VDC	0V.	0V.	-.8VDC	0V.	6.3VAC
2	7Q7	0V.	240VDC	80VDC	-5.4VDC	0V.	-.8VDC	0V.	6.3VAC
3	7A7	0V.	240VDC	90VDC	0V.	0V.	-.4VDC	2.8VDC	6.3VAC
4	7A7	0V.	240VDC	90VDC	0V.	0V.	-.6VDC	2VDC	6.3VAC
5	7A6	0V.	0V.	0V.	0V.	0V.	-.4VDC	0V.	6.3VAC
7	7A4	0V.	110VDC	240VDC	0V.	0V.	0V.	5VDC	6.3VAC
8	7A4	0V.	90VDC	0V.	240VDC	0V.	0V.	4.4VDC	6.3VAC
9	7A4	0V.	110VDC	0V.	0V.	0V.	0V.	5VDC	6.3VAC
10	7C5	0V.	250VDC	260VDC	0V.	0V.	0V.	17VDC	6.3VAC
11	7C5	0V.	250VDC	260VDC	0V.	0V.	0V.	17VDC	6.3VAC
12	5U4G	0V.	335VDC	0V.	310VAC	0V.	310VAC	0V.	335VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	7A7	0Ω	170KΩ	25KΩ	0Ω	0Ω	5.6 Meg	0Ω	.1Ω
2	7Q7	0Ω	170KΩ	196KΩ	20KΩ	0Ω	3.4 Meg	.2Ω	.1Ω
3	7A7	0Ω	170KΩ	220KΩ	0Ω	0Ω	3.4 Meg	2.2Ω	.1Ω
4	7A7	0Ω	170KΩ	220KΩ	0Ω	0Ω	1.5 Meg.	22Ω	.1Ω
5	7A6	0Ω	INF.	INF.	0Ω	INF.	170KΩ	0Ω	.1Ω
7	7A4	0Ω	270KΩ	170KΩ	INF.	500KΩ	500KΩ	4.7KΩ	.1Ω
8	7A4	0Ω	270KΩ	INF.	350KΩ	0Ω	470KΩ	4.7KΩ	.1Ω
9	7A4	0Ω	270KΩ	INF.	0Ω	INF.	600KΩ	4.7KΩ	.1Ω
10	7C5	0Ω	170KΩ	170KΩ	600KΩ	INF.	470KΩ	270Ω	.1Ω
11	7C5	0Ω	170KΩ	170KΩ	600KΩ	INF.	470KΩ	27Ω	.1Ω
12	5U4G	INF.	170KΩ	INF.	56Ω	INF.	54Ω	INF.	170KΩ

RADIO-PHONO SWITCH IN RADIO POSITION.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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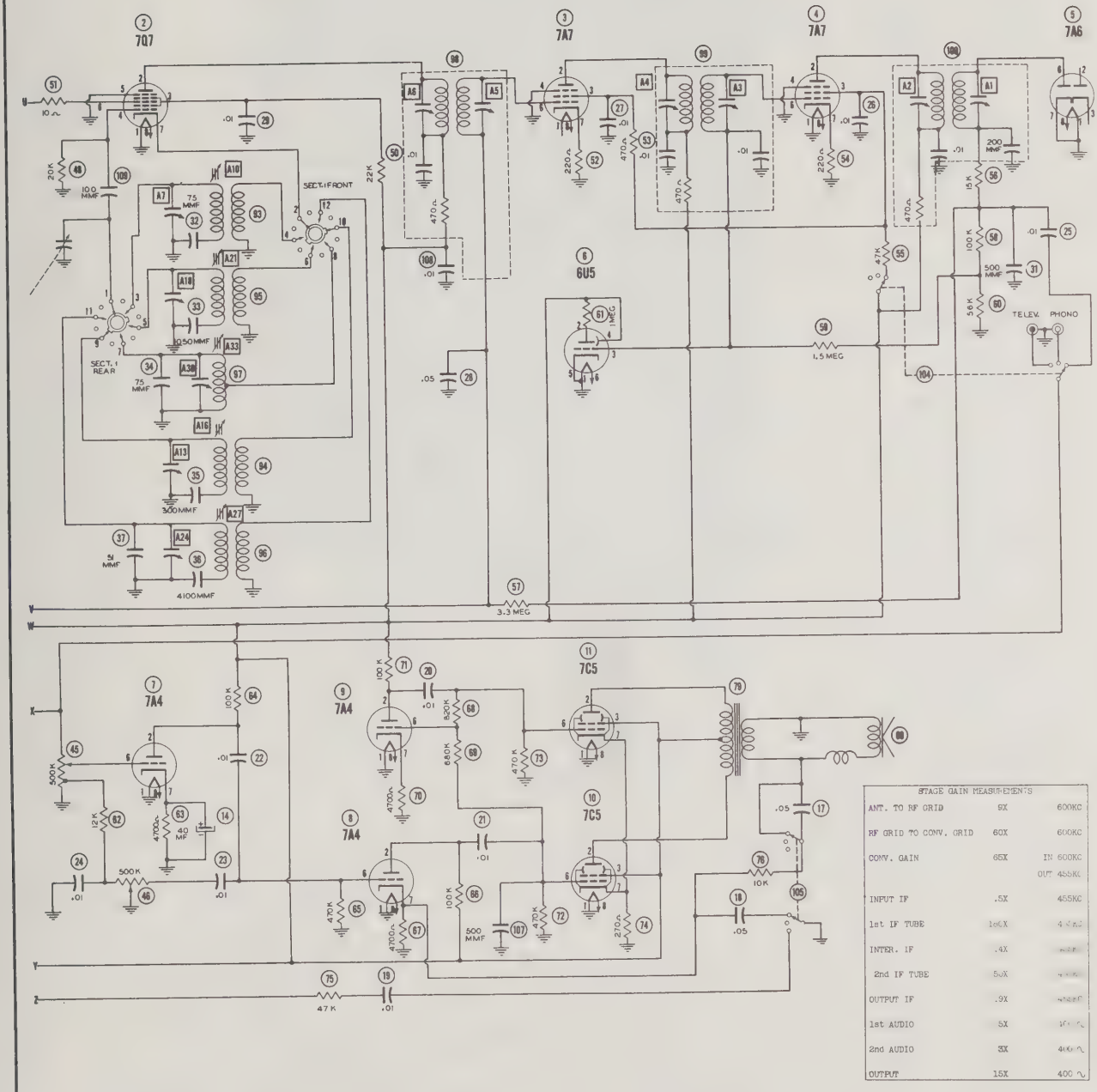

STAGE GAIN MEASUREMENTS		
ANT. TO RF GRID	9X	600KC
RF GRID TO CONV. GRID	60X	600KC
CONV. GAIN	65X	IN 600KC OUT 455KC
INPUT IF	.5X	455KC
1st IF TUBE	160X	455KC
INTER. IF	.4X	455KC
2nd IF TUBE	50X	455KC
OUTPUT IF	.9X	455KC
1st AUDIO	5X	1000 ∿
2nd AUDIO	3X	400 ∿
OUTPUT	15X	400 ∿

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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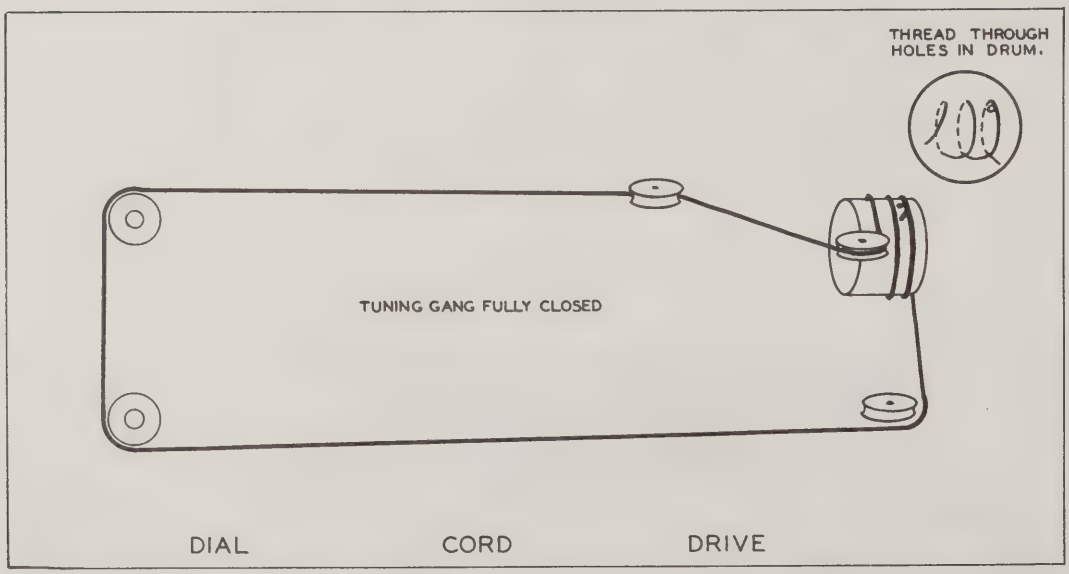
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low frequency end of dial.

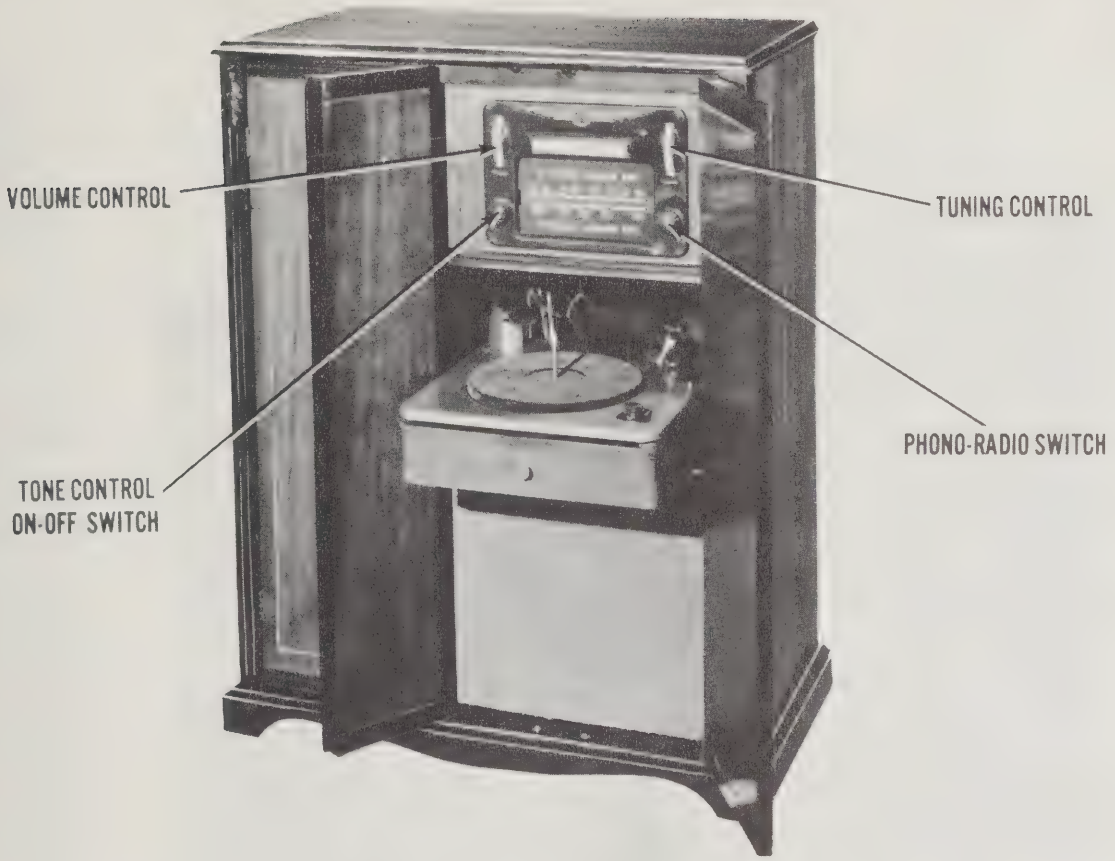
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.05 MFD	High side to Pin 6 (grid) of 7Q7. Low side to chassis.	456KC	Band "B"	1000KC	Across voice coil	A1,A2, A3,A4, A5,A6.	Adjust for maximum output
2	200MMFD in series with 400Ω carbon res.	High side to ant. terminal "A". Low side to chassis.	400KC	Band "A"	400KC	"	A7,A8, A9	" " " "
3	"	"	150KC	"	150KC	"	A10, A11, A12.	Adjust for maximum output. Repeat Steps 2 & 3 until no further improvement can be made.
4	"	"	1600KC	Band "B"	1600KC	"	A13, A14, A15	Adjust for maximum output with loop plugged in.
5	"	"	550KC	"	550KC	"	A16, A17	Adjust for maximum output with loop plugged in. Repeat Steps 4 & 5 until no further improvement can be made.
6	"	"	4.7MC	Band "C"	4.7MC	"	A18, A19, A20	Adjust for maximum output
7	"	"	1.6MC	"	1.6MC	"	A21, A22, A23	Adjust for maximum output. Repeat Steps 6 & 7 until no further improvement can be made.
8	"	"	10MC	Band "D"	10MC	"	A24, A25, A26	Adjust for maximum output
9	"	"	5MC	"	5MC	"	A27, A28, A29	Adjust for maximum output. Repeat Steps 8 & 9 until no further improvement can be made.
10	"	"	22MC	Band "E"	22MC	"	A30, A31, A32	Adjust for maximum output
11	"	"	11.5MC	"	11.5MC	"	A33, A34, A35	Adjust for maximum output. Repeat Steps 10 & 11 until no further improvement can be made.



MIDWEST MODELS R-12,
RG-12, RT-12 (Ch. RGT-12)



MIDWEST MODELS R-12,
RG-12, RT-12 (Ch. RGT-12)

TRADE NAME	Midwest, Models R-12, RG-12, RT-12 (Ch. RGT-12)
MANUFACTURER	Midwest Radio Corp., 909 Broadway, Cincinnati, Ohio
TYPE SET	AC Operated AM-FM Superheterodyne Receiver with Loop Antenna
TUBES (TWELVE)	Types, 6BA6 FM RF Amp., 6BE6 FM Converter, 6C4 FM AFC, 6A7 AM RF Amp., 7Q7 AM Converter, 7A7 1st IF Amp., 7A7 2nd IF Amp., 6AL5 FM Ratio Det., 7E6 AM Det.-1st AF, 7A4 2nd AF, 7C5 Power Output, 5U4G Rectifier.
POWER SUPPLY	105-125 Volts AC
RATING	.74 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540-1650KC FREQ. MOD. 88-108MC

PUSHBUTTON ADJUSTMENTS

1. Turn receiver on and allow it to warm up for at least fifteen minutes.
2. Remove buttons and loosen set screws for each button shaft.
3. Manually tune in station desired to be set up and push in completely any button shaft.
4. Hold button shaft in and tighten set screw firmly.
5. Check accuracy of setting by detuning with the manual tuning control and returning with pushbutton shaft. If setting is off repeat Steps 3, 4 and 5.
6. Replace button.
7. To set up the remaining buttons follow the same procedure as outlined above.

HOWARD W. SAMS & CO., INC. **Indianapolis Indiana**

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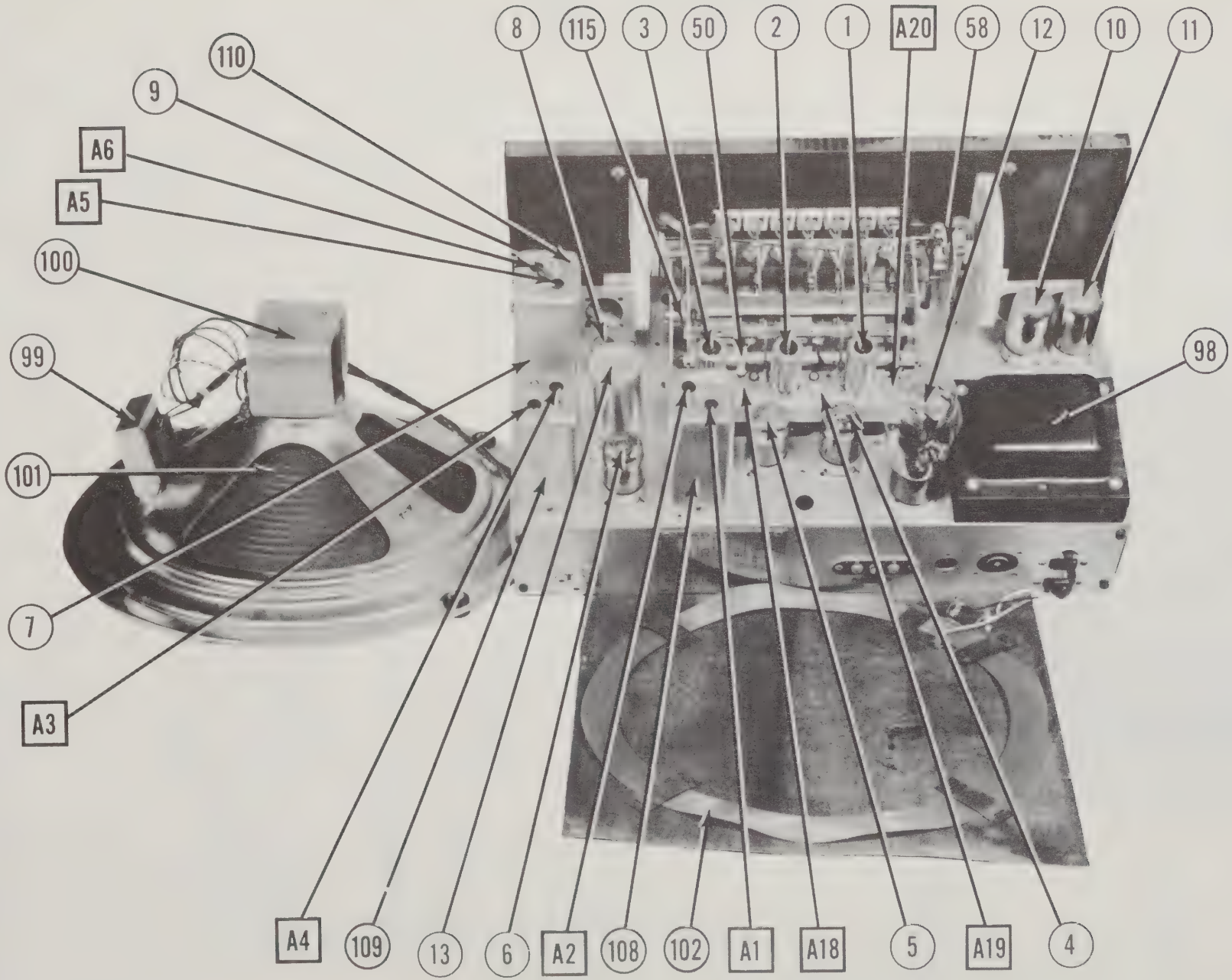

8
115
3
50
2
1
A20
58
12
10
11
110
9
A6
A5
100
99
101
7
A3
98
A4
109
13
6
A2
108
102
A1
A18
5
A19
4

MIDWEST MODELS R-12,
RG-12, RT-12 (Ch. RGT-12) PAGE 3

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MIDWEST PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	FM RF Amp.	6BA6	6BA6	7BK	
2	FM Conv.	6BE6	6BE6	7CH	
3	FM AFC	6C4	6C4	6BG	
4	AM RF Amp.	7A7	7A7	8V	
5	AM Converter	7Q7	7Q7	8AL	
6	1st IF Amp.	7A7	7A7	8V	
7	2nd IF Amp.	7A7	7A7	8V	
8	FM Ratio Det.	6AL5	6AL5	6BT	
9	AM Det.-1st AF	7E6	7E6	8W	
10	2nd AF	7A4	7A4	5AC	
11	Power Output	7C5	7C5	6AA	
12	Rectifier	5U4G	5U4G	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MIDWEST PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
13A	40	450	CE-6	AF88J	UP4445	DY-2x40-450	EL-240	▲ Filter
B	40	450						▲ "
14	40	25	CE-4	PRS25/50	BR502	M-50-25	TA-50	Cathode Bypass
15	8	150	CE-7	PR8150/8	BR815	M-8-150	UT-81	Stabilizing Cap.
16	.01	800		684-01	DT6S1	MPH-6-01	TC-11	Line Filter
17	.01	800		684-01	DT6S1	MPH-6-01	TC-11	" "
18	.01	800		684-01	DT6S1	ST-6-01	TC-11	Audio Coupling
19	.01	800		684-01	DT6S1	ST-6-01	TC-11	" "
20	.01	200		484-01	DT2S1	ST-4-01	TC-11	Tone Compensation
21	.01	200		484-01	DT2S1	ST-4-01	TC-11	" "
22	.01	200		484-01	DT2S1	ST-4-01	TC-11	Audio Coupling
23	.01	200		484-01	DT2S1	ST-4-01	TC-11	" "
24	.01	800		684-01	DT6S1	ST-6-01	TC-11	2nd IF Plate Decoup.
25	.01	800		684-01	DT6S1	ST-6-01	TC-11	2nd IF Screen Bypass
26	.01	200		484-01	DT2S1	ST-4-01	TC-11	AVC Filter
27	.01	800		684-01	DT6S1	ST-6-01	TC-11	1st IF Decoupling
28	.01	800		684-01	DT6S1	ST-6-01	TC-11	1st IF Screen Bypass
29	.01	200		484-01	DT2S1	ST-4-01	TC-11	AVC Filter
30	.01	800		684-01	DT6S1	ST-6-01	TC-11	RF Bypass Pwr. Supply
31	.01	800		684-01	DT6S1	ST-6-01	TC-11	" " " "
32	.01	800		684-01	DT6S1	ST-6-01	TC-11	AM Conv. Screen Bypass
33	.01	800		684-01	DT6S1	ST-6-01	TC-11	AM RF Screen Bypass
34	.01	800		684-01	DT6S1	ST-6-01	TC-11	AVC Filter
35	.01	200		484-01	DT2S1	ST-4-01	TC-11	" "
36	.01	200		484-01	DT2S1	ST-4-01	TC-11	AFC Cathode Bypass
37	.05	200		484-05	DT2S5	ST-4-05	TC-15	Feedback
38	500	500		1468-0005	5W5T5	MO.5-35	1FM-35	Output Grid Bypass
39	200	300		1468-0002	5W5T2	MO.5-32	1FM-32	Diode RF Filter-Cer.
40	200	300		1468-0002	5W5T2	MO.5-32	1FM-32	" " " "
41	2000	300		1467-002	1W5D2	MW.5-22	1FM-22	De-emphasis-Cer.
42	100	300		1469-0001	5R5T1	MOS.5-31	MS-31	Diode Load Cap.-Note 1-Cer
43	100	300		1469-0001	5R5T1	MOS.5-31	MS-31	" " " " " "
44	3	600						Balancing Capacitor
45	300	500		1468-0003	5W5T3	MO.5-33	1FM-33	Fixed Padder
46	100	300		1468-0001	5W5T1	MO.5-31	1FM-31	AM Osc. Grid Cap.
47	200	300		1468-0002	5W5T2	MO.5-32	1FM-32	RF Coupling
48	5	300		1469-000005	5R5V5	MOS.5-55	MS-55	Phase Shift Cap.
49	5	300		1469-000005	5R5V5	MOS.5-55	MS-55	Osc. Coupling
50	200	300		1469-0002	5R5T2	MOS.5-32	MS-32	Fixed Padder
51	50	300		1468-00005	5W5Q5	MO.5-45	1FM-45	FM Osc. Grid Cap.
52	1000	300		1468-001	1W5D1	MO.3-21	1FM-21	FM Conv. Screen Bypass
53	50	300		1468-00005	5W5Q5	MO.5-45	1FM-45	RF Coupling
54	1000	300		1468-001	1W5D1	MO.3-21	1FM-21	RF Bypass Pwr. Supply
55	100	300		1468-0001	5W5T1	MO.5-31	1FM-31	FM RF Screen Bypass
56	100	300		1468-0001	5W5T1	MO.5-31	1FM-31	FM RF Cathode Bypass
57	100	300		1468-0001	5W5T1	MO.5-31	1FM-31	Filament Bypass

Note 1-If either Item 42 or 43 are replaced, replace both with capacitors of equal value.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: MIDWEST PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDAR'N PART No.	REPLACEMENT DATA: MERIT PART No.	INSTALLATION NOTES
99	4300Ω	4.7Ω	170Ω	.3Ω	Part of SP-5	A-3825	T22S58	A-2930#	#Drill new mounting holes.

SPEAKER

ITEM No.	RATINGS: FIELD RES	RATINGS: VC IMP.	REPLACEMENT DATA: MIDWEST PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	INSTALLATION NOTES
100	1050Ω	4.7Ω	SP-5	ST-663 Mod. F15-C		
	CONE DIA.	VC DIA.				
101	11½"	1"				

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: MIDWEST PART No.	REPLACEMENT DATA: MEISSNER PART No.	
102	Loop Ant.	0Ω	1.3Ω			
103	FM Ant.Coil	.7Ω	0Ω			
104	BC RF Coil	83Ω	2.6Ω	UK-12	14-1057	
105	FM " "		0Ω			
106	BC Osc. "	.4Ω	5.2Ω	UK-13	14-1060	
107	FM " "		0Ω			
108A	AM 1st IF	6.6Ω	9Ω†	TR-11		
B	FM " "	1.8Ω				
109A	AM 2nd IF	9Ω*	9Ω†	TR-12		
B	FM " "					
110A	AM 3rd "	9.6Ω*	6.4Ω			*Includes both primaries. †Includes both secondaries.
B	FM Det. Trans.		.1Ω			
111	RF Plate Choke		.1Ω			

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: MIDWEST PART No.	REPLACEMENT DATA	INSTALLATION NOTES
112	Screw	6-8	0.25	Blue	IL-1		Type 46
113	"	6-8	0.25	"	IL-1		" "

MISCELLANEOUS

ITEM No.	PART NAME	MIDWEST PART No.	NOTES
114	Switch	SR-8	Band
115	3 Gang Var. Cap.	CV-15-2	(13-505MMF, 13-505MMF, 13-350MMF)
	Dial	AD-11	Glass
	Pointer	AP-21	

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	MIDWEST PART No.	IRC PART No.	CLAROSTAT PART No.	
58	500KΩ	½	RV-6			Volume Control tapped @ 450KΩ
59A	500KΩ	½	RV-5	D11-133	AM-58-S	Tone Control
B	Shaft		Not Req.	E	KSS-3	Attach to 59A per instructions
C	Switch		" "	41	SW-A	" " " " "

RESISTORS

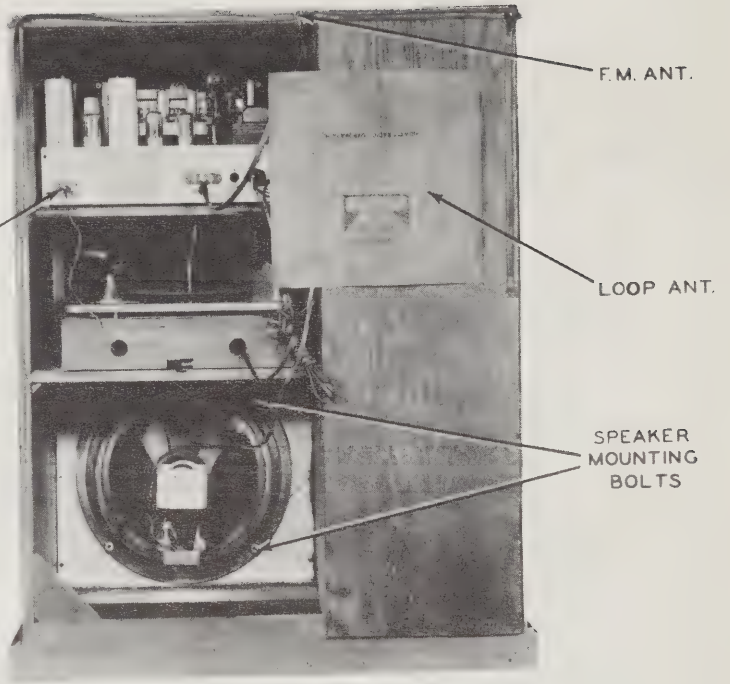
ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	MIDWEST PART No.	IRC PART No.	
60	100Ω	½			Br.-Blk.-Br. FM RF Cathode
61	100KΩ	½		BTS-100K	Br.-Blk.-Yl. FM RF Screen
62	10Ω	½			Br.-Blk.-Blk. Parasitic Supp.
63	22KΩ	2		BT-2-22K	Red-Red-Or. FM Osc. Screen
64	22KΩ	½		BTS-22K	Red-Red-Or. FM Osc. Grid
65	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. FM AFC Grid
66	2200Ω	½		BTS-2200	Red-Red-Red FM AFC Cathode
67	47KΩ	1		BTA-47K	Yl.-Vi.-Or. FM AFC Plate Load
68	2.2 Meg.	½		BTS-2.2 Meg	Red-Red-Grn. AM RF Grid
69	82KΩ	½		BTS-82K	Gray-Red-Or. AM RF Screen
70	10Ω	½			Br.-Blk.-Blk. Parasitic Supp.
71	22KΩ	2		BT-2-22K	Red-Red-Or. AM Conv. Screen
72	22KΩ	½		BTS-22K	Red-Red-Or. AM Oscillator Grid
73	220Ω	½			Red-Red-Br. 1st IF Cathode
74	470Ω	½		BTS-470	Yl.-Vi.-Br. 1st IF Screen Decoup.
75	150KΩ	½		BTS-150K	Br.-Grn.-Yl. AVC Network
76	220Ω	½			Red-Red-Br. 2nd IF Cathode
77	47KΩ	1		BTS-47K	Yl.-Vi.-Or. Voltage Dropping
78	470Ω	½		BTS-470	Yl.-Vi.-Br. 2nd IF Plate Decoup.
79	15KΩ	½		BTS-15K	Br.-Grn.-Or. Diode Filter
80	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Diode Load
81	1.5 Meg.	½		BTS-1.5 Meg	Br.-Grn.-Grn. AVC Network
82	22KΩ	½		BTS-22K	Red-Red-Or. De-emphasis
83	15KΩ	½		BTS-15K	Br.-Grn.-Or. Ratio Det. Diode Load
84	15KΩ	½		BTS-15K	Br.-Grn.-Or. " " " "
85	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. AFC Network
86	4700Ω	½		BTS-4700	Yl.-Vi.-Red 1st AF Cathode
87	100KΩ	½		BTS-100K	Br.-Blk.-Yl. 1st AF Plate Load
88	100KΩ	½		BTS-100K	Br.-Blk.-Yl. 2nd AF Plate Load
89	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. 2nd AF Grid
90	4700Ω	½		BTS-4700	Yl.-Vi.-Red 2nd AF Cathode
91	12KΩ	½		BTS-12K	Br.-Red-Or. Tone Comp.
92	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
93	270Ω	3		AB-250	Red-Vi.-Br. Output Cathode
94	10KΩ	½		BTS-10K	Br.-Blk.-Or. Feedback
95	39Ω	1		BW-1-39	Or.-White-Blk. Filament Dropping-See Note
96	270Ω	3		AB-250	Red-Vi.-Br. Surge Limiter-See Note
97	10Ω	½		BW-½-10	Br.-Blk.-Blk. Series Pilot Light-See Note
116	10Ω	½		BW-½-10	Br.-Blk.-Blk. " " " " "

Note-Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	MIDWEST PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
98	117VAC @ .74A	620VCT .067A DC	5.2VAC @ 3.0A	6.5VAC @ 3.5A	TP-8	P-8314‡	T22R07‡	P-2955‡

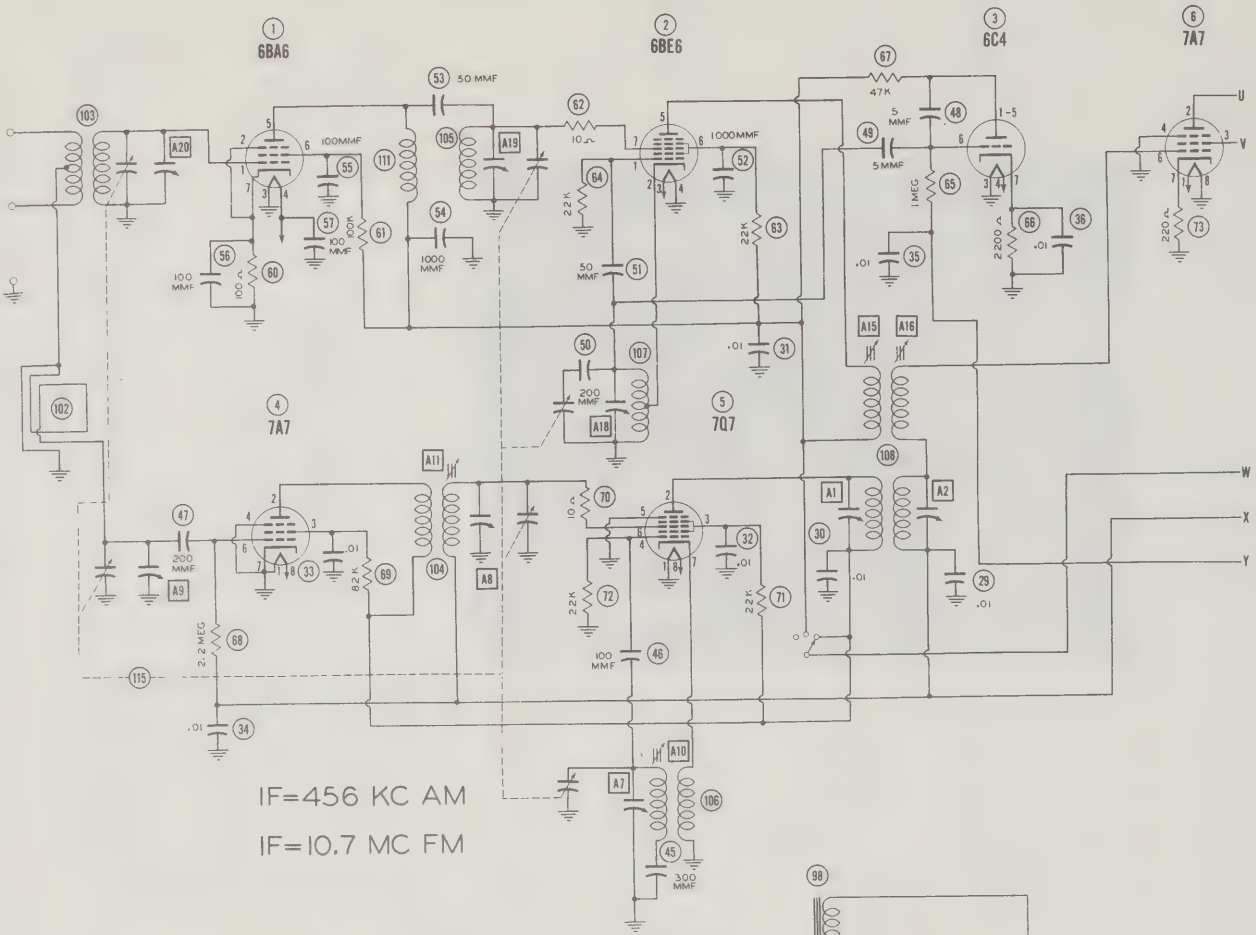
‡Add series resistor to reduce plate voltage.

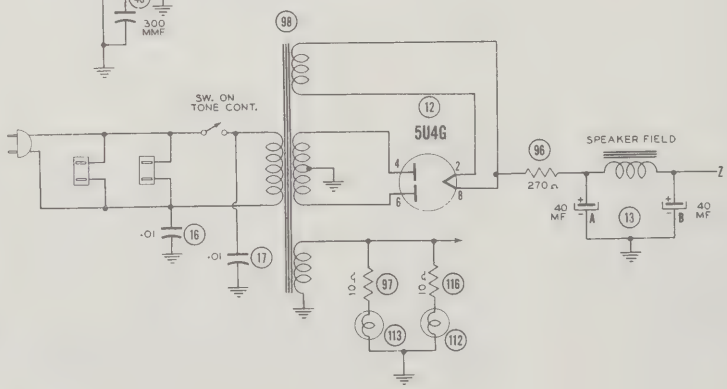


DISASSEMBLY INSTRUCTIONS

1. Remove phono-pickup plug from chassis.
2. Remove loop antenna plug from chassis.
3. Remove FM antenna leads from terminal strip on rear of chassis.
4. Remove speaker plug from speaker.
5. Remove phono-motor plug from chassis.
6. Remove four hex head machine screws holding chassis in cabinet. Remove chassis from cabinet.
7. Remove four Phillips head wood screws holding speaker in cabinet. Remove speaker from cabinet.

DATE 8/48-#4814-13
SET #44-FOLDER #13





STAGE GAIN MEASUREMENTS		
ANTENNA TO RF GRID	10X	600KC
RF GRID TO CONV. GRID	25X	600KC
CONVERSION GAIN	15X	IN 600KC OUT 456KC
INPUT IF	1X	456KC
1st IF TUBE	70X	456KC
INTER. IF	1X	456KC
2nd IF TUBE	85X	456KC
OUTPUT IF	.4X	456KC
1st AUDIO	6X	400 ∿
2nd AUDIO	5X	400 ∿
OUTPUT	10X	400 ∿

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

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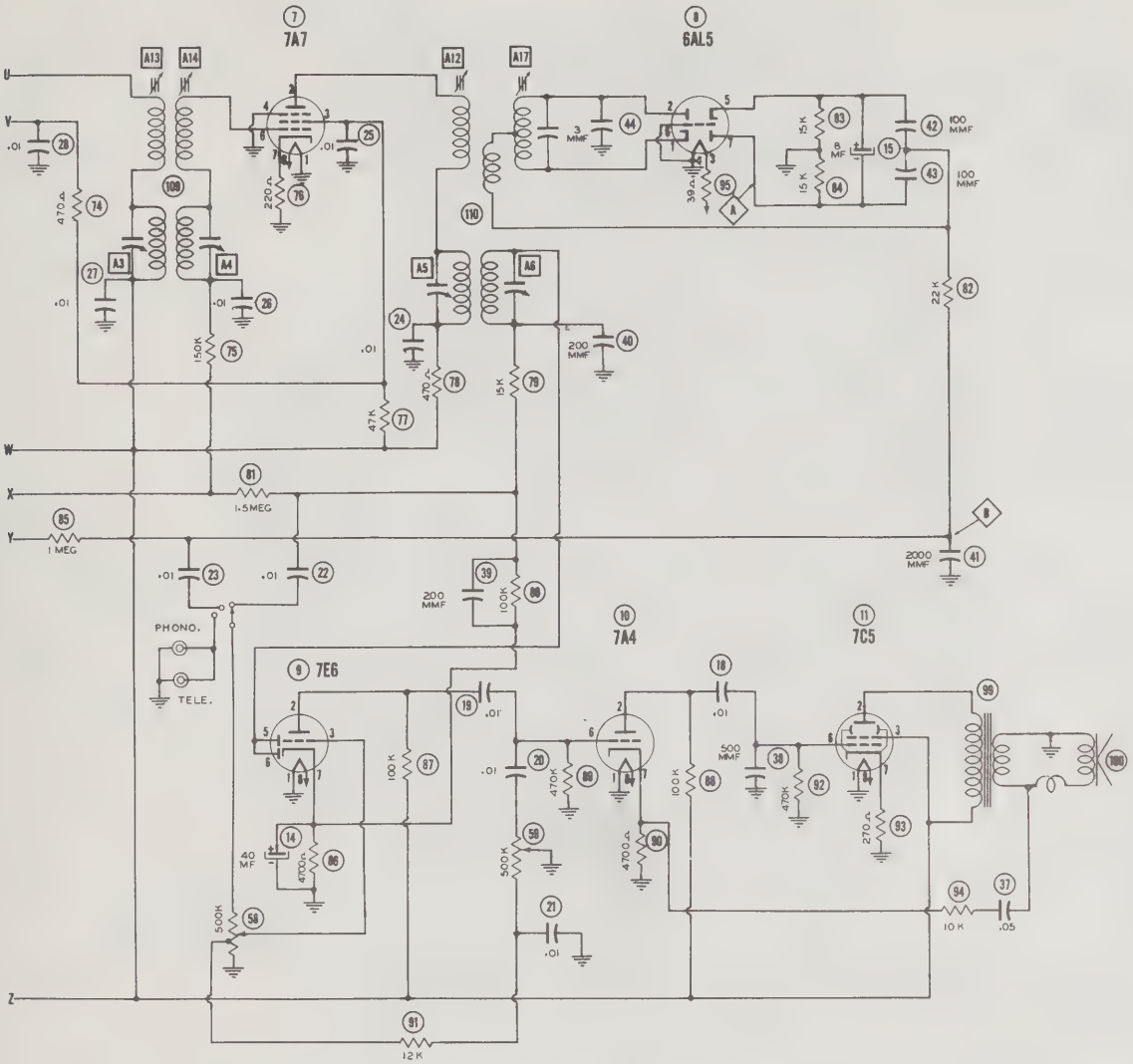

VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6BA6‡	0V.	0V.	0V.	6.5VAC	170VDC	80VDC	0V.	-
2	6BE6‡	-2VDC§	0V.	0V.	6.5VAC	220VDC	80VDC	0V.	-
3	6C4‡	125VDC	0V.	0V.	6.5VAC	125VDC	0V.	5.6VDC	-
4	7A7	0V.	220VDC	60VDC	0V.	0V.	0V.	0V.	6.5VAC
5	7Q7	0V.	220VDC	90VDC	-5.4VDC§	0V.	0V.	1.6VDC	6.5VAC
6	7A7	0V.	220VDC	70VDC	0V.	0V.	0V.	1.6VDC	6.5VAC
7	7A7	0V.	220VDC	70VDC	0V.	0V.	0V.	1.7VDC	6.5VAC
8	6AL5‡	0V.	0V.	0.5VAC	0V.	.8VDC	0V.	-.8VDC	-
9	7E6	0V.	110VDC	0V.	6VDC	3.8VDC	3.8VDC	6VDC	6.5VAC
10	7A4	0V.	110VDC	0V.	0V.	5.5VDC	0V.	5.8VDC	6.5VAC
11	7C5	0V.	220VDC	225VDC	0V.	0V.	0V.	11.5VDC	6.5VAC
12	5U4G	0V.	315VDC	0V.	310VAC	0V.	310VAC	0V.	315VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6BA6‡	0Ω	100Ω	0Ω	.1Ω	160KΩ	260KΩ	1.5	-
2	6BE6‡	22KΩ	0Ω	0Ω	.1Ω	160KΩ	180KΩ	10%	-
3	6C4‡	220KΩ	0Ω	0Ω	.1Ω	200KΩ	INF.	2.2KΩ	-
4	7A7	0Ω	160KΩ	240KΩ	0Ω	0Ω	4 Meg.	0Ω	.1Ω
5	7Q7	0Ω	160KΩ	180KΩ	22KΩ	0Ω	1.6 Meg.	.4Ω	.1Ω
6	7A7	0Ω	160KΩ	200KΩ	0Ω	0Ω	1.6 Meg.	220Ω	.1Ω
7	7A7	0Ω	160KΩ	200KΩ	0Ω	0Ω	1.7 Meg.	220Ω	.1Ω
8	6AL5‡	INF.	INF.	.1Ω	0Ω	15KΩ	0Ω	15KΩ	-
9	7E6	0Ω	260KΩ	500KΩ	4.7KΩ	110KΩ	110KΩ	4.7KΩ	.1Ω
10	7A4	0Ω	260KΩ	INF.	INF.	16KΩ	470KΩ	4.7KΩ	.1Ω
11	7C5	0Ω	160KΩ	160KΩ	1Ω	INF.	470KΩ	270Ω	.1Ω
12	5U4G	INF.	160KΩ	INF.	60Ω	INF.	56Ω	INF.	100KΩ

‡ VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY
ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to left edge of white dial calibration line.

Use insulated alignment screwdriver for all adjustments.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.05 MFD	High side to Pin 6 (grid) of 7Q7. Low side to chassis.	456KC	AM	1000KC	Across voice coil	A1, A2, A3, A4, A5, A6	Adjust for maximum output
2	200MMFD in series with 400Ω carbon res.	High side to terminal "A" on ant. terminal strip. Low side to chassis.	1600KC	"	1600KC	"	A7, A8, A9	" " " "
3	"	"	550KC	"	550KC	"	A10, A11	Adjust for maximum output Repeat Steps 2 & 3 until no further improvement can be made.

FIG. 1

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4	Direct	High side to Pin 7 (grid) of 6BE6. Low side to chassis.	10.7MC (Unmodulated)	FM	100MC	DC probe to Point (A). Common to chassis	A12, A13 A14, A15 A16	Adjust for maximum deflection.
5	"	"	"	"	"	DC probe to Point (B). Common to chassis	A17	Adjust for zero deflection. Continue with FM-RF Alignment in Step 7.

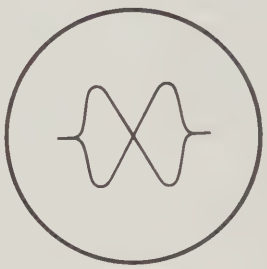


FIG. 2

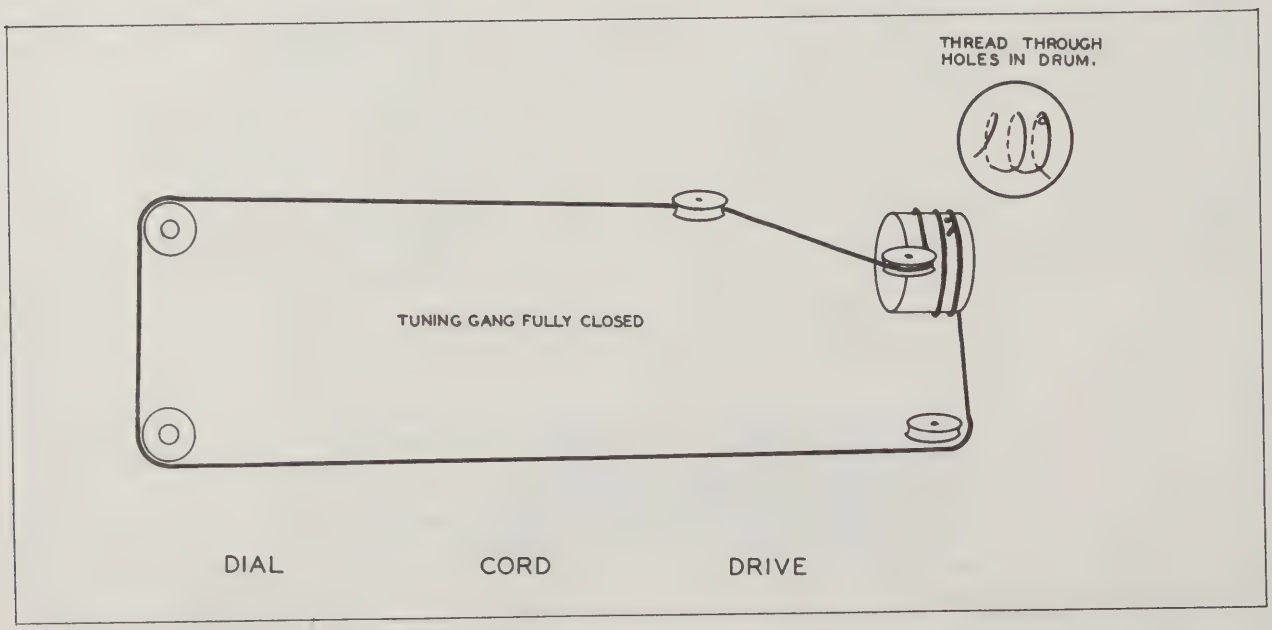
FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use freq. modulated signal with 60 ∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4	.01 MFD	High side to Pin 6 (grid) of 7A7 1st IF Tube (6). Low side to chassis.	10.7MC (Freq. Mod.)	FM	100MC	Vertical input to Point (A). Ground to chassis.	A12, A13, A14	Disconnect 8 MFD cap. from Point (A). Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1.
5	.01 MFD	High side to FM stator of center section of tuning cap. Low side to chassis.	"	"	"	"	A15, A16	Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. Reconnect 8 MFD cap. to Point (A).
6	.01 MFD	High side to Pin 6 (grid) of 7A7 1st IF Tube (6). Low side to chassis.	"	"	"	Vertical input to Point (B). Ground to chassis.	A17	Adjust for maximum straightness of cross-over lines with cross-over occurring at center of pattern per Fig. 2. Continue with FM-RF Alignment in Step 7.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7	2 - 150Ω carbon res.	Each side to "A" ant. terminals.	105MC (Unmodulated)	FM	105MC	DC probe to Point (A). Common to chassis	A18, A19, A20	Adjust for maximum deflection.



MOTOROLA MODEL
67F61BN (Ch. HS-69)

MOTOROLA MODEL
67F61BN (Ch. HS-69)

MOTOROLA MODEL 67F61BN

TRADE NAME	Motorola, Model 67F61BN (Ch. HS-69)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago, Ill.
TYPE SET	AC Operated Multi-Band Superheterodyne Receiver
TUBES(SIX)	Types, 6SG7 RF Amp., 6SB7Y Converter, 6SG7 IF Amp., 6SQ7GT Det.-AVC-AF, 6K6GT Power Output, 5Y3GT Rectifier.
POWER SUPPLY	115 or 130 or 230 Volts AC RATING .52 Amp. @ 117 Volts AC
SHORT WAVE	3-9.1MC, 8.8-10.6MC, 10.5-13.9MC, 13.8-16.6MC, 16.5-22.5MC
TUNING RANGE-BROADCAST	532-1620KC

HOWARD W. SAMS & CO., INC. Indianapolis Indiana

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DATE 8/48-#4814-14 SET #44-FOLDER #14

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	6SG7	6SG7	8BK	
2	Converter	6SB7Y	6SB7Y	8R	
3	IF Amp.	6SG7	6SG7	8BK	
4	Det.-AVC-AF	6SQ7GT	6SQ7GT	8Q	
5	Power Output	6K6GT	6K6GT	7S	
6	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	30	400	23A76473	AF88J4A	UP3345	DY-313	EL-330	Filter-Red
B	30	400						" -Grn.
C	50	25			BR502			Cathode Bypass-Plain
8	.02	400	8A76495	484-02	DT4S2	ST-4-02	TC-12	Line Filter
9	.02	400	8A76495	484-02	DT4S2	ST-4-02	TC-12	" "
10	.005	600	8A76496	684-005	DT6D5	ST-6-005	TC-25	Output Plate Bypass
11	.05	400	8A76497	484-05	DT4S5	ST-4-05	TC-15	Audio Coupling
12	.005	600	8A76496	684-005	DT6D5	ST-6-005	TC-25	Tone Compensation
13	.005	600	8A76496	684-005	DT6D5	ST-6-005	TC-25	" "
14	.005	600	8A76496	684-005	DT6D5	ST-6-005	TC-25	Audio Coupling
15	.1	400	8A76494	484-.1	DT4P1	ST-4-1	TC-1	RF Bypass Pwr. Supply
16	.1	400	8A76494	484-.1	DT4P1	ST-4-1	TC-1	Screen Bypass
17	.02	400	8A76495	484-02	DT4S2	ST-4-02	TC-12	AVC Filter
18	.02	400	8A76495	484-02	DT4S2	ST-4-02	TC-12	Conv. Plate Decoup.
19	.1	400	8A76494	484-.1	DT4P1	ST-4-1	TC-1	Conv. Screen Bypass
20	400	500	21R6664	1468-0004	5W5T4	MO.5-34	1FM-34	AF Plate Bypass
21	400	500	21R6664	1468-0004	5W5T4	MO.5-34	1FM-34	Phono Tone Comp.
22	200	500	21R6697	1468-0002	5W5T2	MO.5-32	1FM-32	Diode RF Filter
23	535	500	21R2731					Fixed Pad
24	3000	300	21R2732	1464-003	1R5D3	MW8.5-23	MS-23	" "
25	50	500	21K83198	1468-00005	5W5Q5	MO.5-45	1FM-45	Osc. Grid Cap.-Cer.
26	400	500	21R6664	1468-0004	5W5T4	MO.5-34	1FM-34	RF Bypass
27	200	500	21R6697	1468-0002	5W5T2	MO.5-32	1FM-32	RF Coupling
28	400	500	21R6664	1469-0004	5R5T4	MOS.5-34	MS-34	Fixed Trimmer
29	200	500	21R6697	1468-0002	5W5T2	MO.5-32	1FM-32	RF Coupling

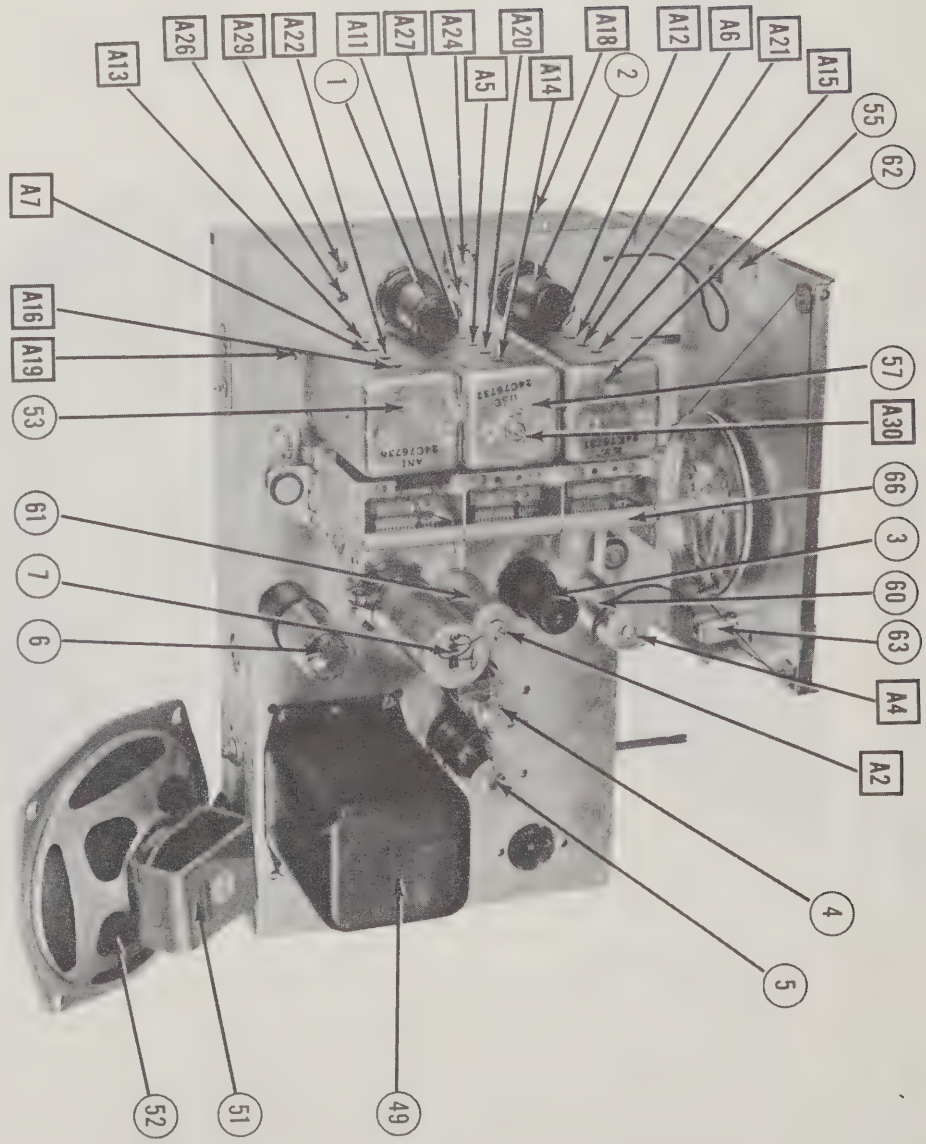
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
30A	1 Meg.	½	18K76685	D13-137X	AT-109	Volume Control tapped @ 300KΩ
B	Shaft		Not Req.	E	KSS-3	Attach to 30A per instructions
C	Switch		" "	41	SW-A	" " " " "
31	1 Meg.	½	18K76686			Tone Control & Radio-Phono Sw.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	IDENTIFICATION CODES
32	1 Meg.	½	6R6004	BTS-1 Meg.	Br.-Blk.-Grn. RF Grid
33	1 Meg.	½	6R6004	BTS-1 Meg.	Br.-Blk.-Grn. Converter Grid
34	220KΩ	½	6R6015	BTS-220K	Red-Red-Yl. Bias Network
35	47KΩ	½	6R6056	BTS-47K	Yl.-Vi.-Or. Oscillator Grid
36	15KΩ	3	6R6306	AB-15K	Br.-Grn.-Or. Converter Screen Dropping
37	2200Ω	½	6R6290	BTS-2200	Red-Red-Red Converter Plate Decoupling
38	47KΩ	2	6R5736	BT-2-47K	Yl.-Vi.-Or. IF Screen Dropping
39	2.2 Meg.	½	6R3927	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
40	1 Meg.	½	6R6004	BTS-1 Meg.	Br.-Blk.-Grn. Diode Load
41	4.7 Meg.	½	6R2122	BTS-4.7 Meg.	Yl.-Vi.-Grn. AF Grid
42	220KΩ	½	6R6015	BTS-220K	Red-Red-Yl. AF Plate Load
43	220KΩ	½	6R6015	BTS-220K	Red-Red-Yl. Output Grid
44	33KΩ	½	6R6012	BTS-33K	Or.-Or.-Or. Tone Compensation
45	470KΩ	½	6R6032	BTS-470K	Yl.-Vi.-Yl. Phono Tone Compensation
46	470KΩ	½	6R6032	BTS-470K	Yl.-Vi.-Yl. Phono Shunt
47	300Ω	2	6R3985	BW-2-330	Or.-Blk.-Br. Bias Network
48	22Ω	½	6R6406	BW-½-22	Red-Red-Blk. " "

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
49	230V AC tapped at 130 VAC & 117V AC @ .52A	590V CT .058V DC @ 2.0A	5.2V AC @ 2.0A	6.3V AC @ 2.0A	25C76842			

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
50	6000Ω	3.3Ω	525Ω	.4Ω	25B76474	A-3478*	T22847*	A-2931*	*Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	VC IMP.		ST-166		
51	1240Ω	3.3Ω	50B76957	Mod. P6-X		
	CONE DIA.	VC DIA.				
52	6-1/16"	1/2"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
53	Ant. Coil Band A	28Ω	5.2Ω	24C76730		Items 53A, B, C & D are shielded and in same can.
A	" " B	.2Ω	.1Ω			
B	" " C	.2Ω	0Ω			
C	" " D	.2Ω	0Ω			
D	" " E & F	0Ω	0Ω	1X76728		
54	RF " A	33.9Ω	.5Ω	24K76731		Items 55A, B, C & D are shielded and in same can.
55	" B	.3Ω	.4Ω			
A	" C	.3Ω	.2Ω			
B	" D	.3Ω	.1Ω			
C	" E & F	0Ω	0Ω	1X76727		
D	Osc. A		4.4Ω	24C76732		Items 57A, B, C & D are shielded and in same can.
56	" B		.2Ω			
57	" C		0Ω			
A	" D		0Ω			
B	" E & F		0Ω	1X76726		
C			0Ω	1X76725		
D						
58	Input IF	13.8Ω	13.2Ω	24B76695	16-6678	
59	Output IF	14Ω	14Ω	24B70537	16-6678	

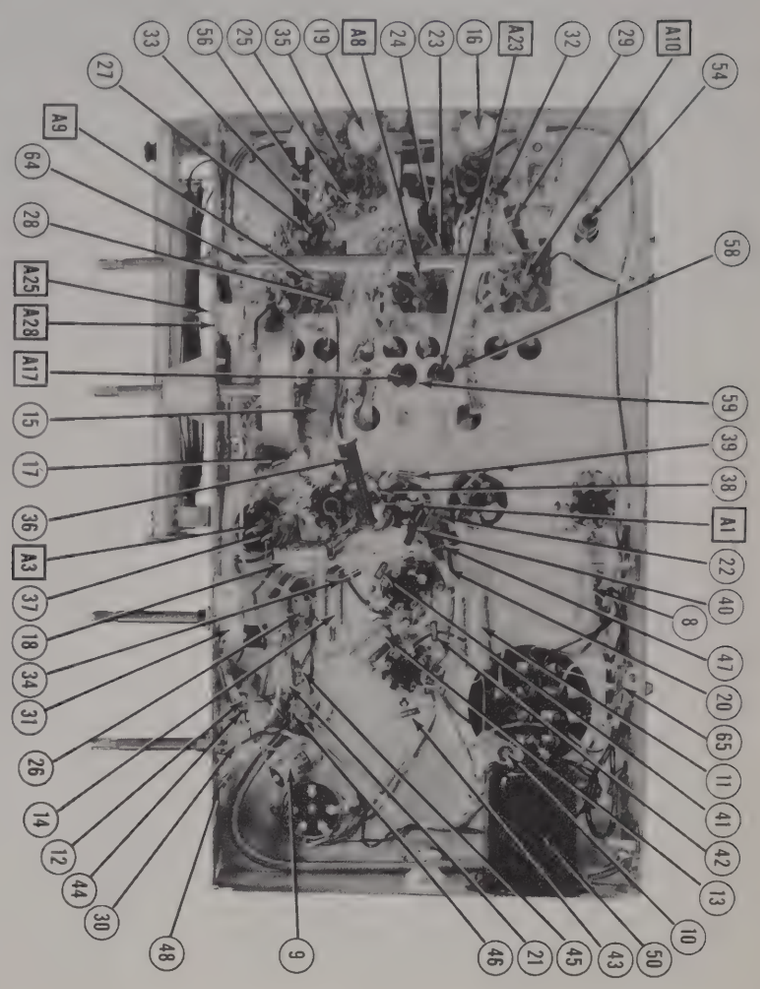
DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					MOTOROLA PART No.		
62	Bayonet	6-8	0.2	White	65X4151		Type 51
63	"	6-8	0.2	"	65X4151		"

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
64	Switch	40B76483	Band
65	"	40A76621	Power Selector (40A76637 Alternate)
66	3 Gang Var.Cap.	19C76476	(10-423 MMF) each section
	Trimmer	20K74940	A5, A11, A14, A20
	Trimmer Strip	20A76734	A6, A12, A15, A21
	Trimmer Strip	20H76734	A7, A13, A16, A22
	Trimmer	20B76642	A24, A27
	Trimmer Strip	20A76614	A25, A28
	"	20A76613	A26, A29
	Dial Scale	34D76705	Glass
	Dial Pointer	52K76676	

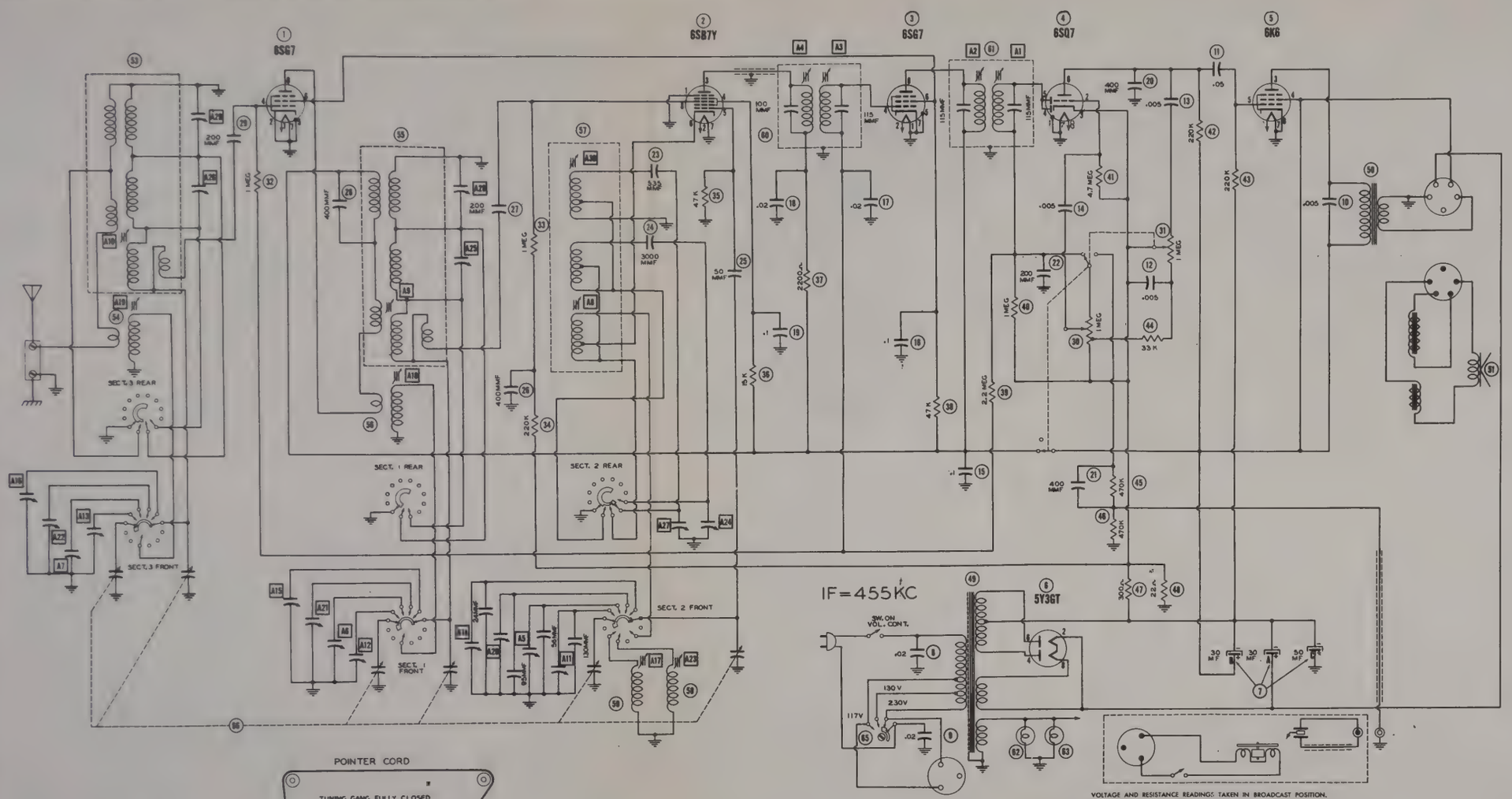
CHASSIS—BOTTOM VIEW

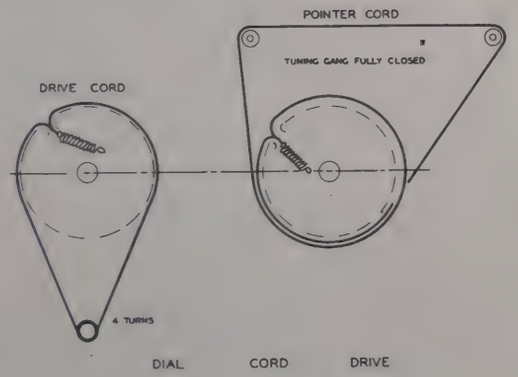


ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to Pin 8 (grid) of 6SB7Y. Low side to chassis.	455KC	Band "A" (fully counter-clock-wise)	Tuning cap. fully open.	Across voice coil	A1, A2, A3, A4,	Adjust for maximum output
2	400Ω carbon res.	High side to ant. terminal. Low side to chassis.	13.8MC	Band "D" (3 positions clock-wise)	13.8MC	"	A5	Adjust for maximum output Tune sig. gen. to 12.89 MC. If signal is not heard, retune sig. gen. to 13.8MC and close A5 to next peak. Adjust for maximum output and re-check for image.
3	"	"	"	"	Tune for maximum output.	"	A6, A7	Rock tuning cap. and adjust for maximum output
4	"	"	10.5MC	"	10.5MC	"	A8	
5	"	"	"	"	Tune for maximum output.	"	A9, A10	Rock tuning cap. & adjust for maximum output. Repeat Steps 2, 3, 4 & 5 until no further improvement can be made, making Steps 2 & 3 the last.
6	"	"	"	Band "C" (2 positions clock-wise)	10.5MC	"	A11	Adjust for maximum output. Tune sig. gen. to 9.59MC. If signal is not heard, retune sig. gen. to 10.5MC and close All to next peak. Adjust for maximum output & recheck for image.
7	"	"	"	"	Tune for maximum output.	"	A12, A13	Rock tuning cap. and adjust for maximum output.
8	"	"	21.5MC	Band "B" (fully clock-wise)	21.5MC	"	A14	Adjust for maximum output. Tune sig. gen. to 20.59 MC. If signal is not heard, retune sig. gen. to 21.5MC and close A14 to next peak. Adjust for maximum output and re-check for image.
9	"	"	"	"	Tune for maximum output.	"	A15, A16	Rock tuning cap. and adjust for maximum output.
10 11	"	"	16.5MC	"	16.5MC Tune for maximum output.	"	A17, A18, A19	Adjust for maximum output. Rock tuning cap. and adjust for maximum output. Repeat Steps 8 & 9 until no further improvement can be made, making Steps 8 & 9 the last.
12	"	"	16.5MC	Band "E" (4 positions clock-wise)	16.5MC	"	A20	Adjust for maximum output. Tune sig. gen. to 15.59MC. If signal is not heard, retune sig. gen. to 16.5MC and close A20 to next peak. Adjust for maximum output and recheck for image.
13	"	"	"	"	Tune for maximum output.	"	A21, A22	Rock tuning cap. and adjust for maximum output.
14	"	"	13.8MC	"	13.8MC	"	A23	Adjust for maximum output. Repeat Steps 12, 13 and 14 until no further improvement can be made making Steps 12 & 13 the last.
15	"	"	9.0MC	Band "F" (1 position clock-wise)	9.0MC	"	A24	Adjust for maximum output. Tune sig. gen. to 9.91MC. If signal is not heard, retune sig. gen. to 9.0MC and open A24 to next peak. Adjust for maximum output and recheck for image.
16	"	"	6.0MC	"	Tune for maximum output.	"	A25, A26, A27	Rock tuning cap. and adjust for maximum output.
17	200MMFD	"	1620KC	Band "A" (fully counter-clock-wise)	Tuning cap. fully open.	"	A25, A26, A27	" " " "
18	200MMFD	"	1400KC	"	"	"	A28, A29, A30	" " " "
19	200MMFD	"	600KC	"	"	"	"	Rock tuning cap. and adjust for maximum output. Repeat Steps 17, 18 and 19 until no further improvement can be made, making Step 17 last adjustment.





STAGE GAIN MEASUREMENTS			
ANTENNA TO RF GRID	3X		600KC
RF GRID TO CONVERTER GRID	5X		600KC
CONVERTER GAIN	30X	IN	600KC
		OUT	455KC
INPUT IF TRANS.	1X		455KC
IF TUBE	230X		455KC
OUTPUT IF TRANS.	1X		455KC
AUDIO	25X		400 ∿
OUTPUT	20X		400 ∿

VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.
RADIO-PHONO SWITCH IN RADIO POSITION.
VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SG7	0V.	6.5VAC	0V.	-.7VDC	0V.	95VDC	0V.	230VDC
2	6SB7Y	0V.	6.5VAC	230VDC	100VDC	6-13.5VDC	0V.	0V.	-.2VDC
3	6SG7	0V.	6.5VAC	0V.	-.5VDC	0V.	95VDC	0V.	230VDC
4	6SQ7GT	0V.	-1.6VDC	-1.2VDC	-1.7VDC	-1.7VDC	120VDC	0V.	6.5VAC
5	6K6GT	0V.	6.5VAC	220VDC	230VDC	-17VDC	-19VDC	0V.	0V.
6	5Y3GT	0V.	300VDC	0V.	285VAC	0V.	295VAC	0V.	300VDC

TAKEN WITH VACUUM TUBE VOLTMETER.
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SG7	0Ω	.1Ω	0Ω	4.2 Meg.	0Ω	78KΩ	0Ω	30KΩ
2	6SB7Y	0Ω	.1Ω	32KΩ	45KΩ	47KΩ	.4Ω	0Ω	1.2 Meg.
3	6SG7	0Ω	.1Ω	0Ω	3.2 Meg.	0Ω	77KΩ	0Ω	30KΩ
4	6sQ7GT	0Ω	4.7 Meg.	22Ω	470KΩ	470KΩ	250KΩ	0Ω	.1Ω
5	6K6GT	INF.	.1Ω	30KΩ	30KΩ	220KΩ	320Ω	0Ω	0Ω
6	5Y3GT	INF.	30KΩ	INF.	540Ω	INF.	540Ω	INF.	30KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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4814-14

PACKARD-BELL MODEL
5D8

PACKARD-BELL MODEL
5D8

PACKARD-BELL MODEL 5D8

TRADE NAME	Packard-Bell, Model 5D8
MANUFACTURER	Packard-Bell Co., 3443 Wilshire Blvd., Los Angeles, Calif.
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types, 12SA7 Converter, 12SK7 IF Amp., 12SQ7 Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	110-120 Volts AC-DC
TUNING RANGE—BROADCAST	540-1750KC RATING .26 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to rear stator of tuning cap. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2	200MMFD	High side to ext. ant. lead. Low side to B-.	1750KC	"	"	A5	Adjust for maximum output. The trimmer opposite A5 is a factory adjustment and ordinarily need not be adjusted.
3	200MMFD	"	1600KC	Tune for maximum output.	"	A6	Adjust for maximum output.

HOWARD W. SAMS & CO., INC. Indianapolis Indiana

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DATE 8/48-#4814-15 SET #44-FOLDER #15

PARTS LIST AND DESCRIPTIONS

PACKARD-BELL MODEL 5D8

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		PACKARD-BELL PART No.	STANDARD REPLACEMENT		
1	Converter	12SA7	12SA7	8R	
2	IF Amp.	12SK7	12SK7	8N	
3	Det.-AVC-AF	12SQ7	12SQ7	8Q	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	PACKARD-BELL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	
6A	40	350		PRS150/40	BR4015	M-40-150	UT-401	Filter
7A	40	350		PRS150/40	BR4015	M-40-150	UT-401	"
6B	50	150		PRS150/50	BR5015	M-50-150	UT-501	Alternate Filter
7B	20	150		PRS150/20	BR2015	M-20-150	UT-201	" "
8	.05	200		484-05	DT2S5	ST-4-05	TC-15	Line Filter
9	.005	600		684-005	DT6D5	ST-6-005	TC-25	Output Plate Bypass
10	.01	500		684-01	DT6S1	ST-6-01	TC-11	Audio Coupling
11	.001	600		684-001	DT6D1	ST-6-001	TC-21	AF Plate Bypass
12	.005	600		684-005	DT6D5	ST-6-005	TC-25	Audio Coupling
13	.05	200		484-05	DT2S5	ST-4-05	TC-15	AVC Filter
14	.1	200		484-.1	DT2P1	ST-2-1	TC-1	Line Isolation
15	220	300		1468-0002	5W5T2	MO.5-32	1FM-32	Diode RF Filter-Cer.
32	100	300		1469-.0001	5R5T1	MOS.5-31	MS-31	Osc. Grid Cap.-Cer.

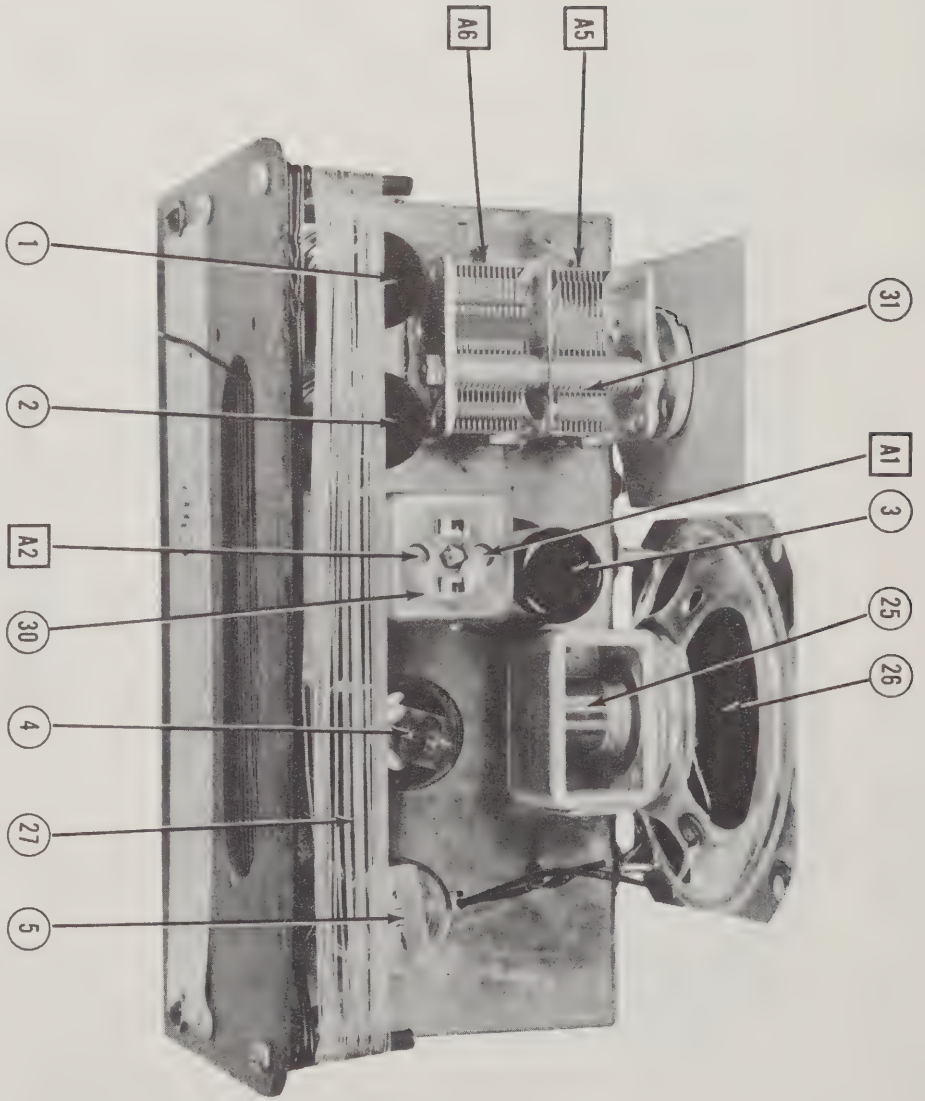
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	PACKARD-BELL PART No.	IRC PART No.	CLAROSTAT PART No.	
16A	500KΩ	½	25001	D13-133	M-60-Z	Volume Control
B	Shaft		Not Req.	A	Not Req.	Attach to 16A per instructions
C	Switch		" "	41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	PACKARD-BELL PART No.	IRC PART No.	
17	22KΩ	½		BTS-22K	Red-Red-Or. Oscillator Grid
18	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. AVC Network
19	4.7 Meg.	½		BTS-4.7 Meg.	Yl.-Vl.-Grn. AF Grid
20	220KΩ	½		BTS-220K	Red-Red-Yl. AF Plate Load
21	470KΩ	½		BTS-470K	Yl.-Vl.-Yl. Output Grid
22	150Ω	1		BW-1-150	Br.-Grn.-Br. Output Cathode
23	1000Ω	1		BTA-1000	Br.-Blk.-Red Filter

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		PACKARD-BELL PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
24	2000Ω	3.8Ω	135Ω	.7Ω	89417	A-3876#	T22S45#	A-2928#	#Bend mounting tabs down on one side.

SPEAKER

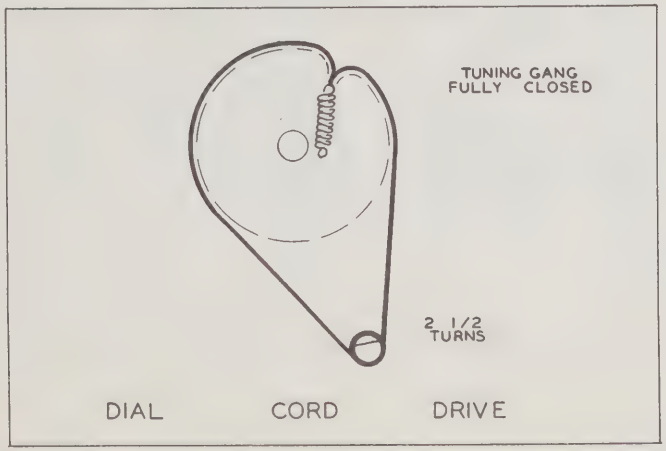
ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			PACKARD-BELL PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	VC IMP.		ST-113		
25	PM	3.8Ω	83004	Mod. P4-X	4A15	
	CONE DIA.	VC DIA.				
26	4"	1/2"				

R F COILS

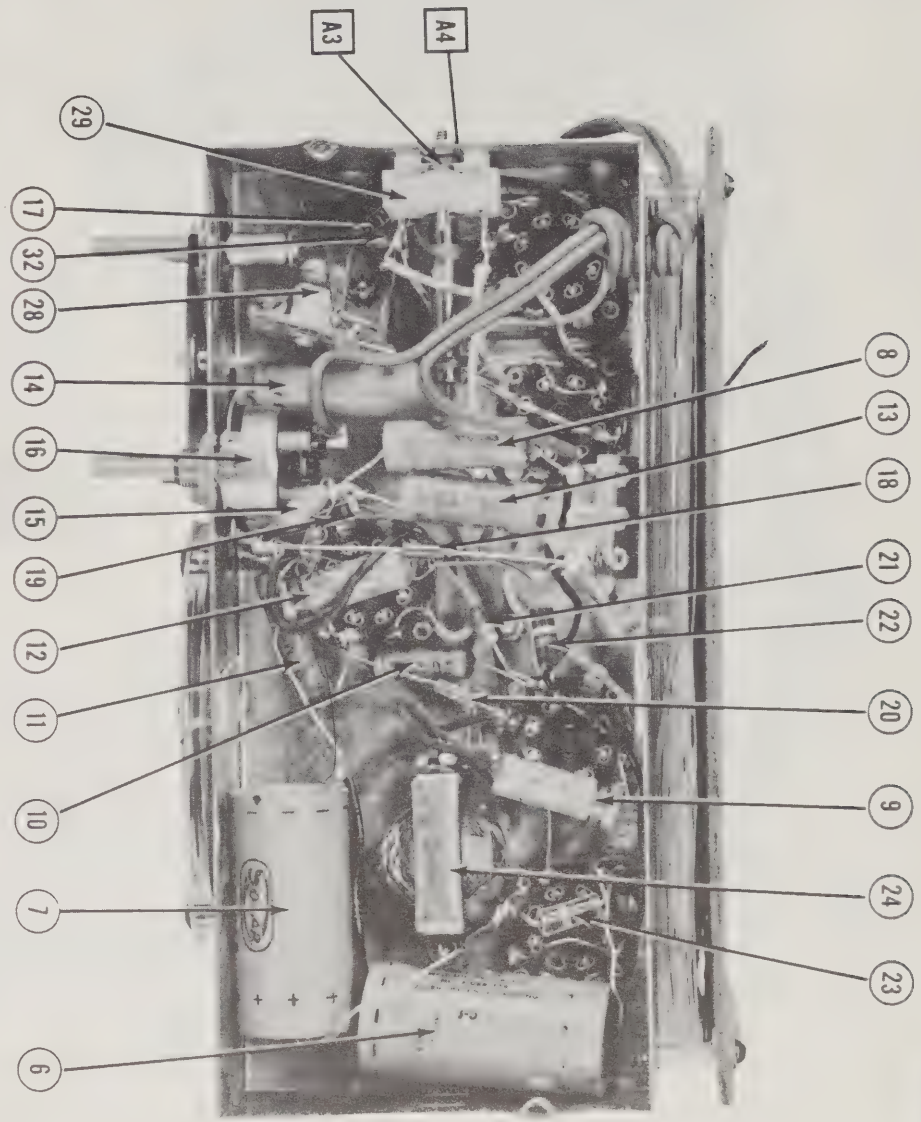
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	PACKARD-BELL PART No.	MEISSNER PART No.	
27	Loop Ant.	0Ω	1.8Ω			
28	Osc. Coil	.8Ω	5.2Ω		14-1060	
29	Input IF	19.5Ω	19.5Ω		16-6661	
30	Output IF	22.6Ω	21.8Ω		16-6660	

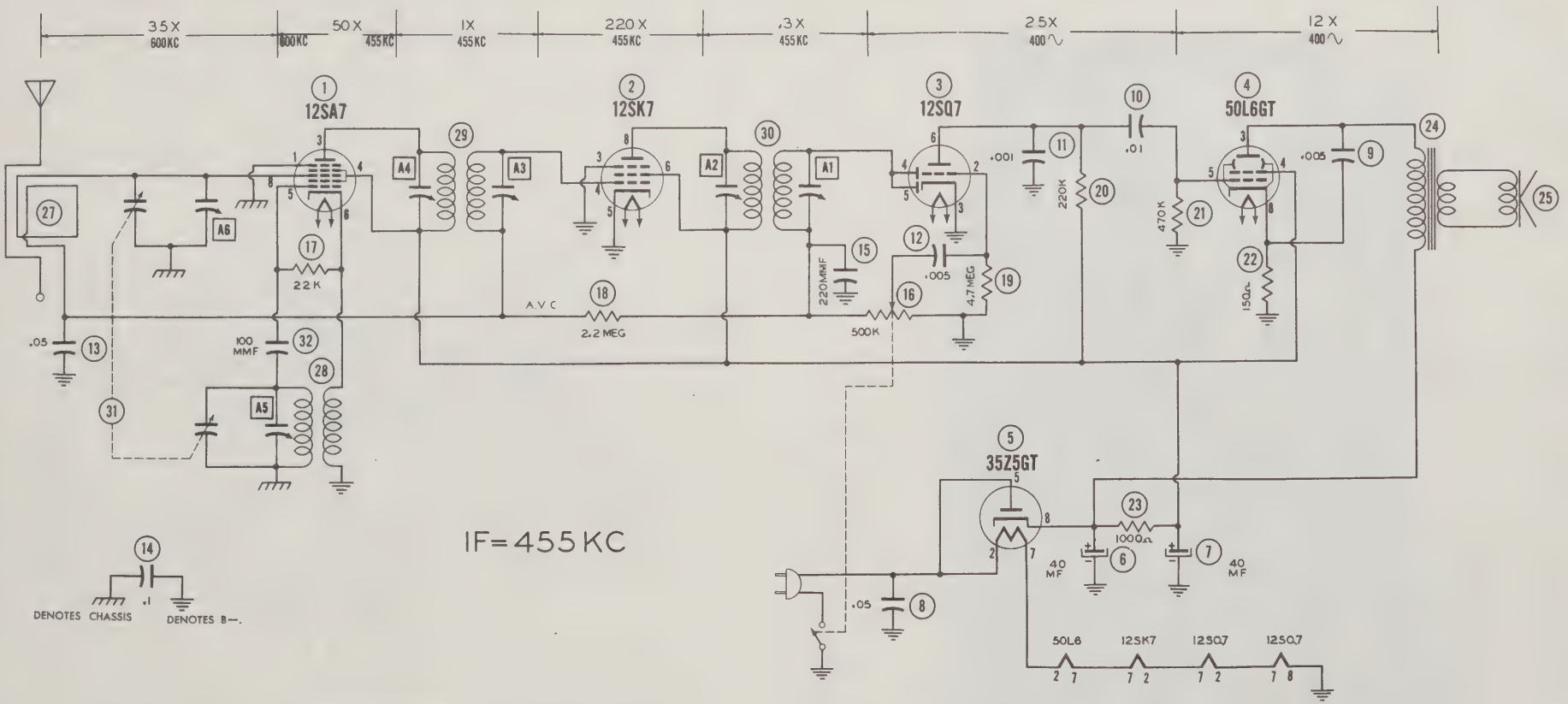
MISCELLANEOUS

ITEM No.	PART NAME	PACKARD-BELL PART No.	NOTES
31	2 Gang Var. Cap		(25-455MMF, 25-195MMF)



CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	0V.	12VAC	95VDC	95VDC	-12VDC§	0V.	24VAC	-.5VDC
2	12SK7	0V.	24VAC	0V.	-.5VDC	0V.	95VDC	37VAC	95VDC
3	12SQ7	0V.	-.4VDC	0V.	-.5VDC	-.5VDC	95VDC	12VAC	0V.
4	50L6GT	0V.	80VAC	125VDC	95VDC	0V.	0V.	37VAC	6VDC
5	35Z5GT	0V.	117VAC	0V.	0V.	117VAC	95VDC	80VAC	130VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	INF.	12Ω	140KΩ	140KΩ	22KΩ	.8Ω	25Ω	2.7 Meg.
2	12SK7	INF.	25Ω	0Ω	2.7 Meg.	0Ω	140KΩ	38Ω	140KΩ
3	12SQ7	0Ω	4.7 Meg.	0Ω	500KΩ	500KΩ	360KΩ	12Ω	0Ω
4	50L6GT	INF.	85Ω	140KΩ	140KΩ	470KΩ	INF.	38Ω	150Ω
5	35Z5GT	INF.	120Ω	INF.	INF.	120Ω	140KΩ	85Ω	140KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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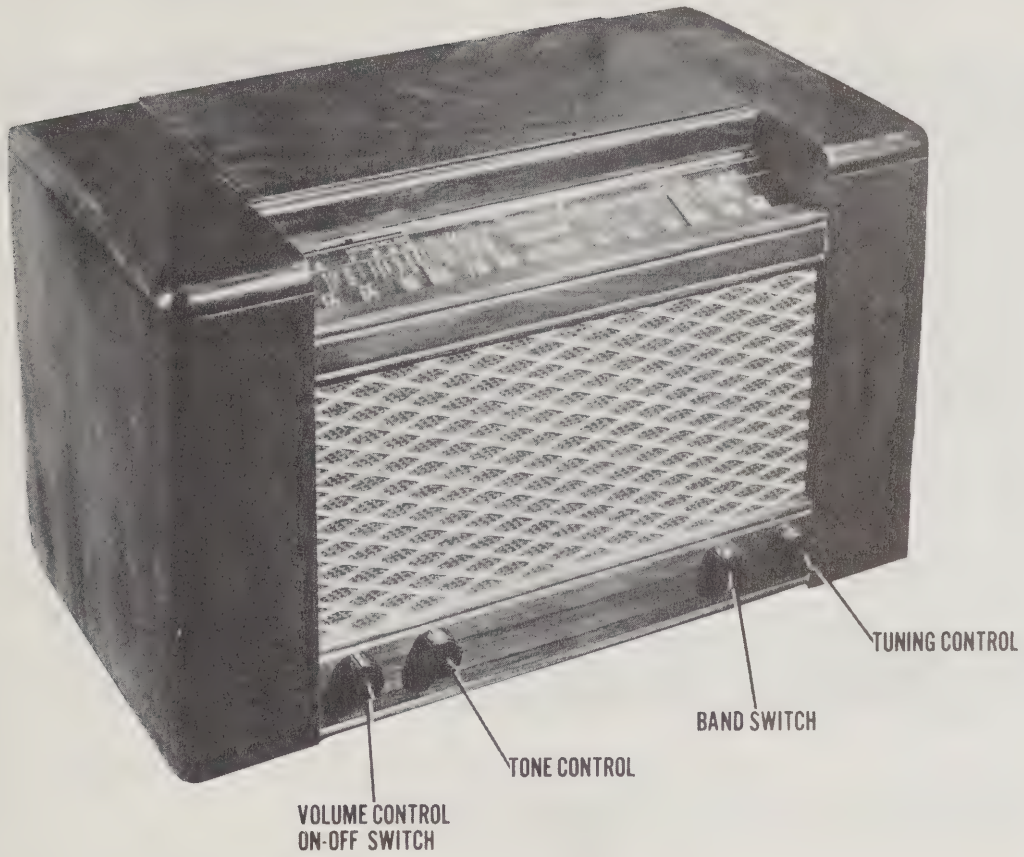
4814-15

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PACKARD-BELL MODEL
771



PACKARD-BELL MODEL
771

PACKARD-BELL MODEL 771

TRADE NAME	Packard-Bell, Model 771
MANUFACTURER	Packard-Bell Co., 3443 Wilshire Blvd., Los Angeles, Calif.
TYPE SET	AC Operated 2 Band Superheterodyne Receiver with Loop Antenna
TUBES (SEVEN)	Types, 6SK7 RF Amp., 6SA7 Converter, 6SK7 IF Amp., 6J5 Det.-AVC, 6SQ7GT AF Amp., 6K6GT Power Output, 6X5GT Rectifier.
POWER SUPPLY	110-120 Volts AC — RATING .38 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1620KC — **SHORT WAVE** 6-18MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial pointers turn tuning cap. fully closed and set pointers 2-5/8" and 8-13/16" respectively from the left edge of dial backplate. These are the calibration marks referred to in steps below.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01 MFD	High side to Pin 8 (grid) of 12SA7. Low side to chassis.	455KC	BC (fully counter clock-wise)	Tuning cap. fully closed	Across voice coil.	A1,A2, A3,A4.	Adjust for maximum output
2		Loop	1620KC	"	Tuning cap. fully open.	"	A5	Fashion loop of several turns of wire and radiate signal into loop of re-ceiver.
3		"	600KC	"	3/4" from calibration marks.	"	A6	Adjust for maximum output
4		"	1500KC	"	Tune for max-imum output.	"	A7,A8	Adjust for maximum output Repeat Steps 2, 3 & 4 until no further improve-ment can be made.
5		"	18MC	SW (fully clock-wise)	Tuning cap. fully open.	"	A9	"
6		"	15MC	"	Tune for maximum output.	"	A10, A11	Rock tuning cap. and ad-just for maximum output.

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DATE 8/48-#4814-16 SET #44-FOLDER #16

PARTS LIST AND DESCRIPTIONS

PACKARD-BELL MODEL 771

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: PACKARD-BELL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	6SK7	6SK7	8N	
2	Converter	6SA7	6SA7	8R	
3	IF Amp.	6SK7	6SK7	8N	
4	Det.-AVC	6J5	6J5	6Q	
5	AF Amp.	6SQ7GT	6SQ7GT	8Q	
6	Power Output	6K6GT	6K6GT	7S	
7	Rectifier	6X5GT	6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PACKARD-BELL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
8	20	350	24003	PRS350/24	BR2045	M-20-350	UT-203	Filter
9	20	350	24003	PRS350/24	BR2045	M-20-350	UT-203	"
10	25	25	24006	PRS25/25	BR252A	M-25-25	TA-25	Bias Filter
11	.01	125		684-.01	DT6S1	ST-6-01	TC-11	Line Filter
12	.02	600	23007	684-.02	DT6S2	ST-6-02	TC-12	Audio Coupling
13	.01	500	23023	684-.01	DT6S1	ST-6-01	TC-11	Tone Comp.
14	.01	500	23023	684-.01	DT6S1	ST-6-01	TC-11	RF Bypass Pwr. Supply-Note
15	.05	400	23009	484-.05	DT4S5	ST-4-05	TC-15	Screen Decoupling
16	.05	200	23017	484-.05	DT2S5	ST-4-05	TC-15	AVC Filter
17	.01	500	23023	684-.01	DT6S1	ST-6-01	TC-11	RF Plate Decoupling
18	.05	400	23009	484-.05	DT4S5	ST-4-05	TC-15	Screen Bypass
19	4000	500	23004	1467-004	1D5D4	MW.5-24	1FM-24	Output Plate Bypass
20	220	500	23206-1	1468-0002	5W5T2	MO.5-32	1FM-32	AF Plate Bypass
21	4000	500	23004	1467-004	1D5D4	MW.5-24	1FM-24	Audio Coupling
22	5100	500						Fixed Padder
23	47	300	23912	1468-00005	5W5Q5	MO.5-45	1FM-45	Osc. Grid Cap.-Cer.
24	220	500	23206-1	1468-0002	5W5T2	MO.5-32	1FM-32	RF Coupling
25	47	300	23912	1468-00005	5W5Q5	MO.5-45	1FM-45	Fixed Trimmer-Cer.
26	220	500	23206-1	1468-0002	5W5T2	MO.5-32	1FM-32	RF Coupling

Note-Not used in all models.

CONTROLS

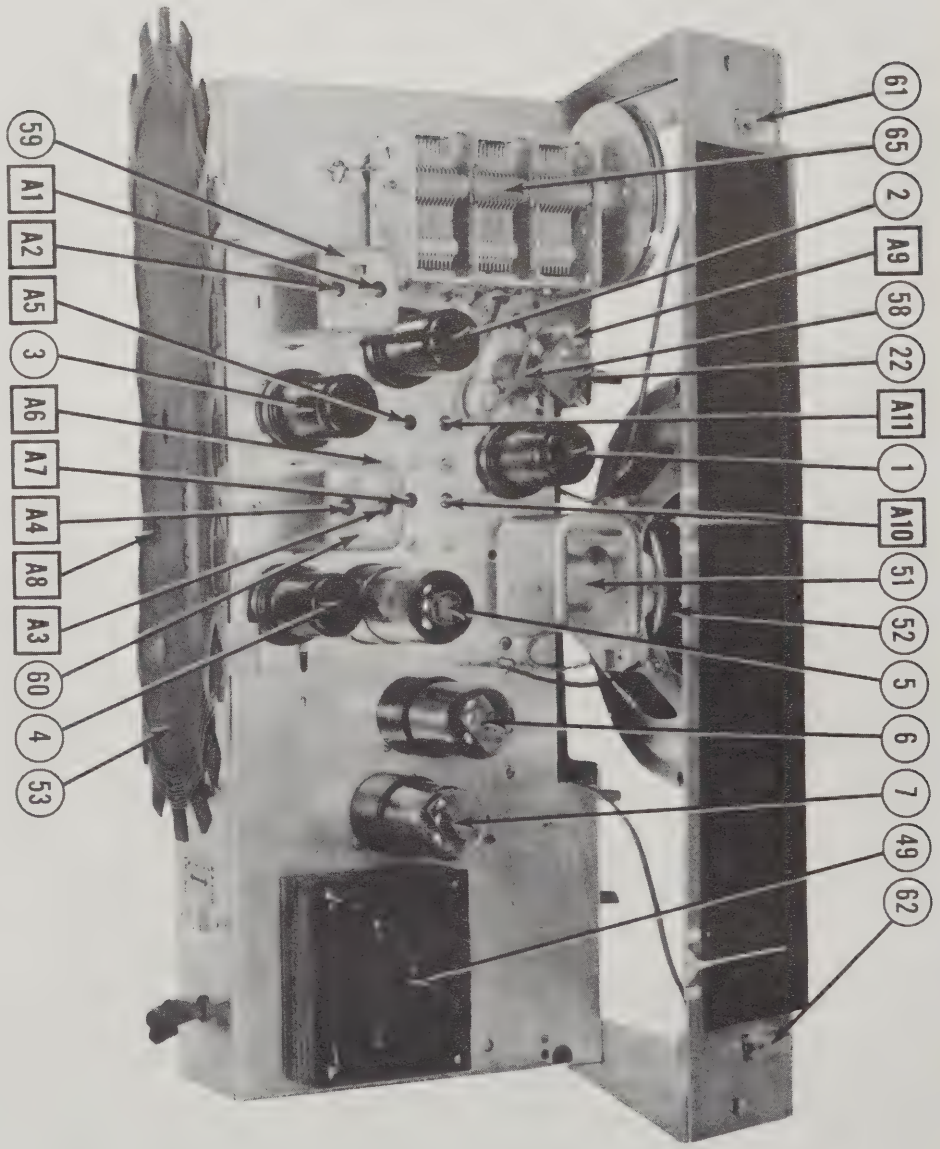
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PACKARD-B. PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
27A	500KΩ	½	25003-B	D13-133	M-60-Z	Volume Control
B	Shaft		Not Req.	A	Not Req.	Attach to 27A per instructions
C	Switch		" "	41	SW-A	" " " " "
28A	3 Meg.	½	25503	D13-140	M-67-Z	Tone Control
B	Shaft		Not Req.	A	Not Req.	Attach to 28A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PACKARD-B. PART No.	IRC PART No.	IDENTIFICATION CODES
29	2.2 Meg.	½	73055	BTS-2.2 Meg.	Red-Red-Grn. RF Grid
30	39Ω	½	73008		Or.-White-Blk. RF Cathode
31	350Ω	1	73070	BW-1-330	Or.-Grn.-Br. RF Cathode
32	47KΩ	½	73045	BTS-47K	Yl.-Vi.-Or. SW RF Coil Shunt-See Note
33	1000Ω	½	73025-1	BTS-1000	Br.-Blk.-Red RF Plate Decoup.
34	22KΩ	½	73041	BTS-22K	Red-Red-Or. Osc. Grid
35	10Ω	½			Br.-Blk.-Blk. Parasitic Supp.
36	1 Meg.	½	73053	BTS-1 Meg.	Br.-Blk.-Grn. Conv. Grid
37	1 Meg.	½	73053	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
38	2.2 Meg.	½	73055	BTS-2.2 Meg.	Red-Red-Grn. " "
39	10KΩ	½	73037-1	BTS-10K	Br.-Blk.-Or. Screen Dropping
40	5600Ω	2	73127	BT-2-5600	Grn.-Blue-Red Decoupling
41	350Ω	1	73020-1	BW-1-330	Or.-Grn.-Br. IF Cathode
42	4.7 Meg.	½		BTS-4.7 Meg.	Yl.-Vi.-Grn. AF Grid
43	39Ω	½	73008	BW-½-39	Or.-White-Blk. AF Cathode
44	220KΩ	½	73049	BTS-220K	Red-Red-Yl. AF Plate Load
45	470KΩ	½	73051	BTS-470K	Yl.-Vi.-Yl. Output Grid
46	560Ω	½	73022	BTS-560	Grn.-Blue-Br. Feedback
47	2000Ω	5	73902	AB-2000	Filter
48	330Ω	1	73070	BW-1-330	Or.-Or.-Br. Bias

Note-Not used in all models.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	PACKARD-BELL PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
49	117V AC @ .38A	520V CT .05A DC	6.0V AC @ 2.8A		89008	P-6119	T22R01	P-3048

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		PACKARD-BELL PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
50A	9000Ω	3.5Ω	700Ω	.6Ω	89402	A-3878	T22S47	A-2931	
B					89410B				

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			PACKARD-BELL PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	VC IMP.		ST-110		
51A	PM	3.5Ω	83302	Mod. P6-V	6A21	
B	PM		83103			
	CONE DIA.	VC DIA.				
52A	6¼"	1/2"				
B	6"x9"					

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	PACKARD-BELL PART No.	MEISSNER PART No.	
53	Loop Ant.	0Ω	1.2Ω	29318-A		
54	SW Ant.Coil		0Ω	29401		
55	BC RF Coil	86Ω	5.3Ω	29102-F	14-1057	
56	SW RF Coil	6.1Ω	0Ω	29101-B		
57	BC Osc.Coil	1Ω	5.9Ω	29205-C	14-1060	
58	SW Osc.Coil	0Ω	0Ω	29201-A		
59	Input IF	17.2Ω	17.2Ω	29004-E	16-6658	
60	Output IF	21.2Ω		29001	16-6670	

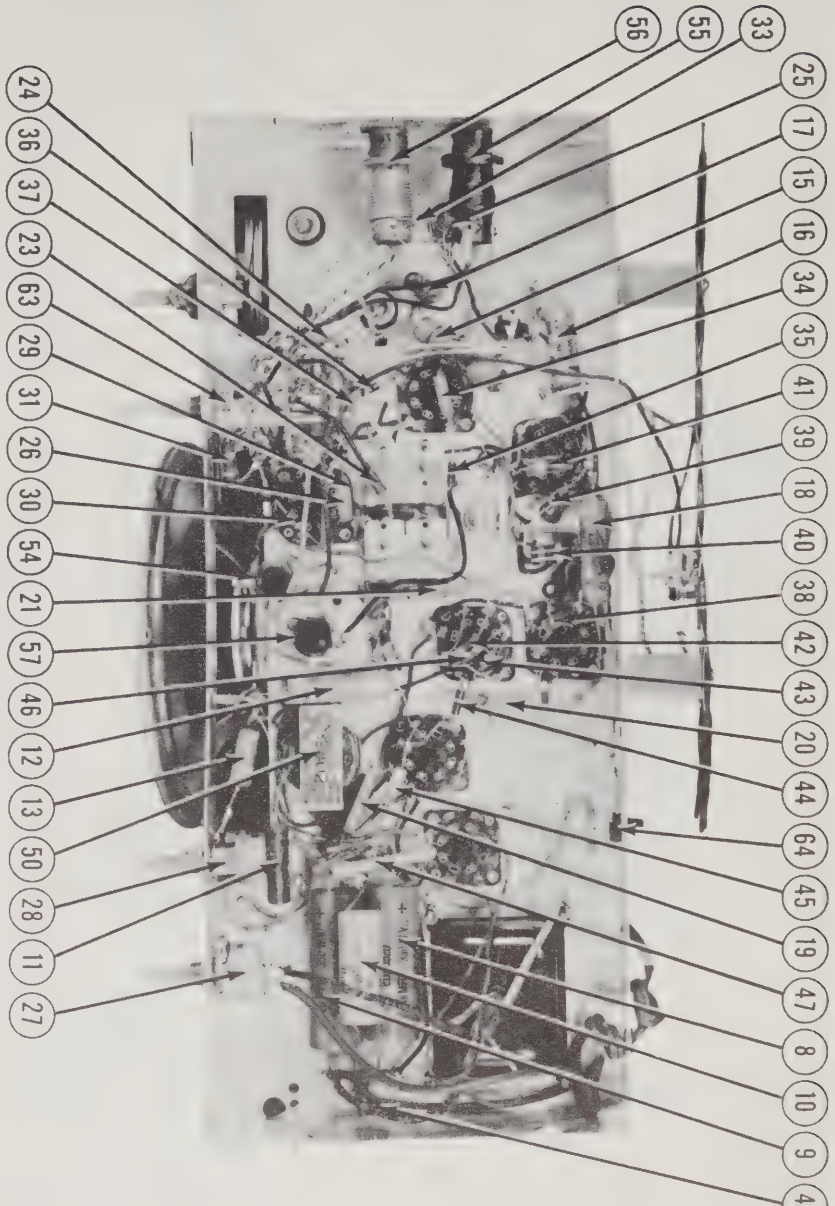
DIAL LIGHT

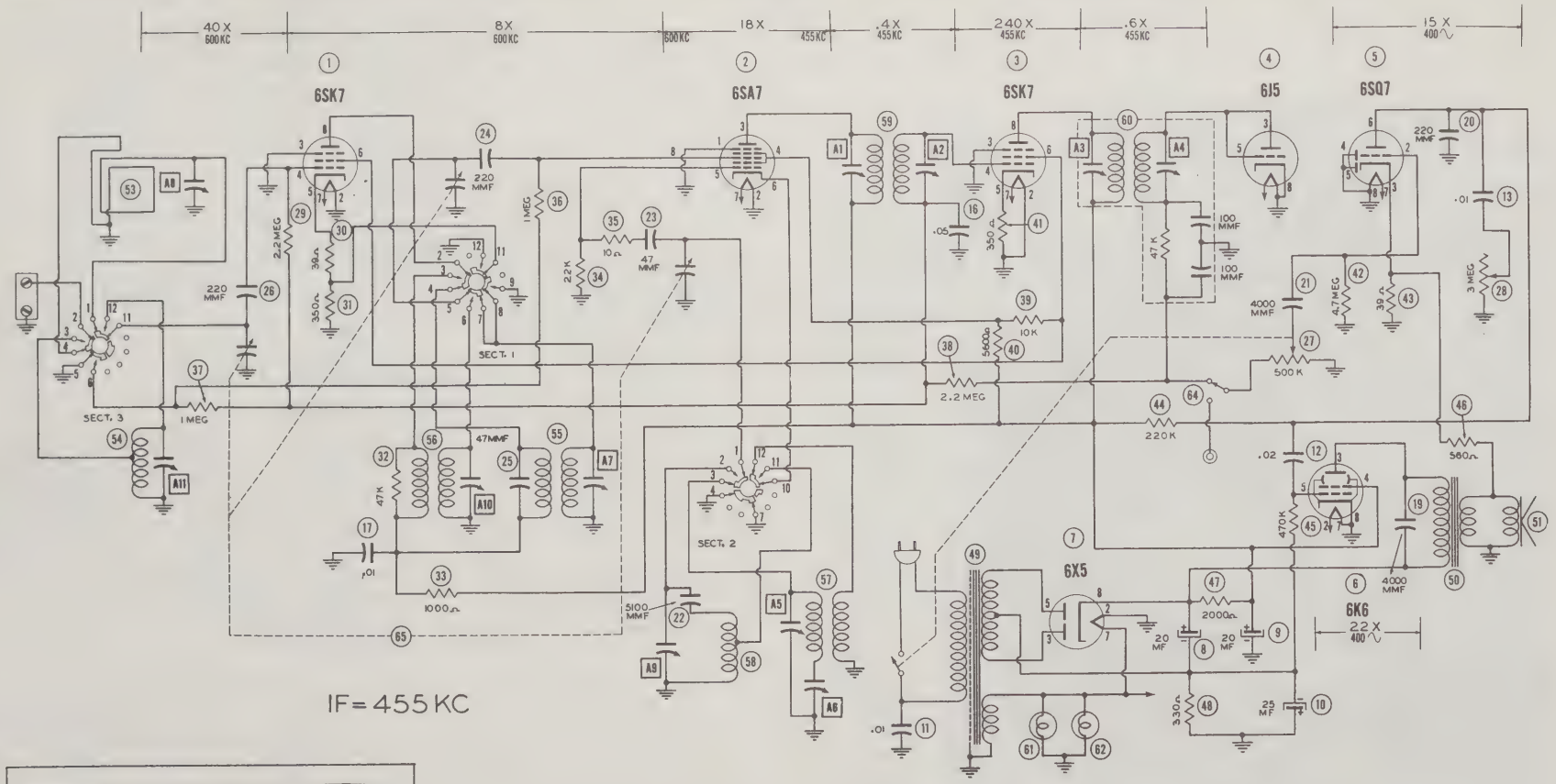
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					PACKARD-BELL PART No.		
61	Bayonet	6-8	0.25	Blue	54001		Type 44
62	"	6-8	0.25	"	54001		" "

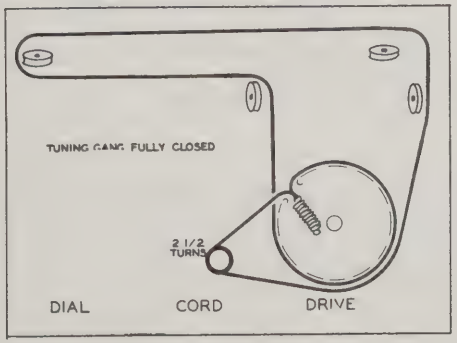
MISCELLANEOUS

ITEM No.	PART NAME	PACKARD-BELL PART No.	NOTES
63	Switch	86001A	Band
64	"	86704	Radio-Phono
65	3 Gang Var. Cap.	23500-C	(12-463MMF) each section
A5 } A11	Trimmer Strip	23401	{BC Osc. Adj. {SW Ant. Adj.
A6	Padder	23404A	BC Osc. Adj.
A7 } A10	Trimmer Strip	23401	{BC RF Adj. {SW RF Adj.
A8	Trimmer	23406	BC Ant. Adj.
A9	"	23406	SW Osc. Adj.
	Dial	38056	Stationized
	"	38058	Eastern
	Pointer Assby.	67022	

CHASSIS—BOTTOM VIEW







VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.
RADIO-PHONO SWITCH IN RADIO POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SK7	0V.	0V.	0V.	-.2VDC	2.2VDC	70VDC	6VAC	200VDC
2	6SA7	0V.	0V.	200VDC	100VDC	-15VDC§	0V.	6VAC	-.2VDC
3	6SK7	0V.	0V.	0V.	-.1VDC	2VDC	70VDC	6VAC	200VDC
4	6J5	0V.	0V.	-.6VDC	-.1VDC	-.6VDC	-.6VDC	6VAC	0V.
5	6SQ7GT	0V.	-.5VDC	0V.	0V.	0V.	100VDC	0V.	6VAC
6	6K6GT	0V.	6VAC	260VDC	210VDC	-6.5VDC	210VDC	0V.	0V.
7	6X5GT	0V.	0V.	260VAC	0V.	260VAC	0V.	6VAC	270VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SK7	0Ω	0Ω	0Ω	5 Meg.	400Ω	85KΩ	.1Ω	75KΩ
2	6SA7	0Ω	0Ω	74KΩ	80KΩ	22KΩ	1Ω	.1Ω	5 Meg.
3	6SK7	0Ω	0Ω	0Ω	2.7 Meg.	300Ω	85KΩ	.1Ω	72KΩ
4	6J5	0Ω	0Ω	550KΩ	3 Meg.	550KΩ	510KΩ	.1Ω	0Ω
5	6SQ7GT	0Ω	4.7 Meg.	39Ω	0Ω	0Ω	290KΩ	0Ω	.1Ω
6	6K6GT	0Ω	.1Ω	70KΩ	70KΩ	470KΩ	70KΩ	0Ω	0Ω
7	6X5GT	INF.	0Ω	625Ω	INF.	650Ω	INF.	.1Ω	70KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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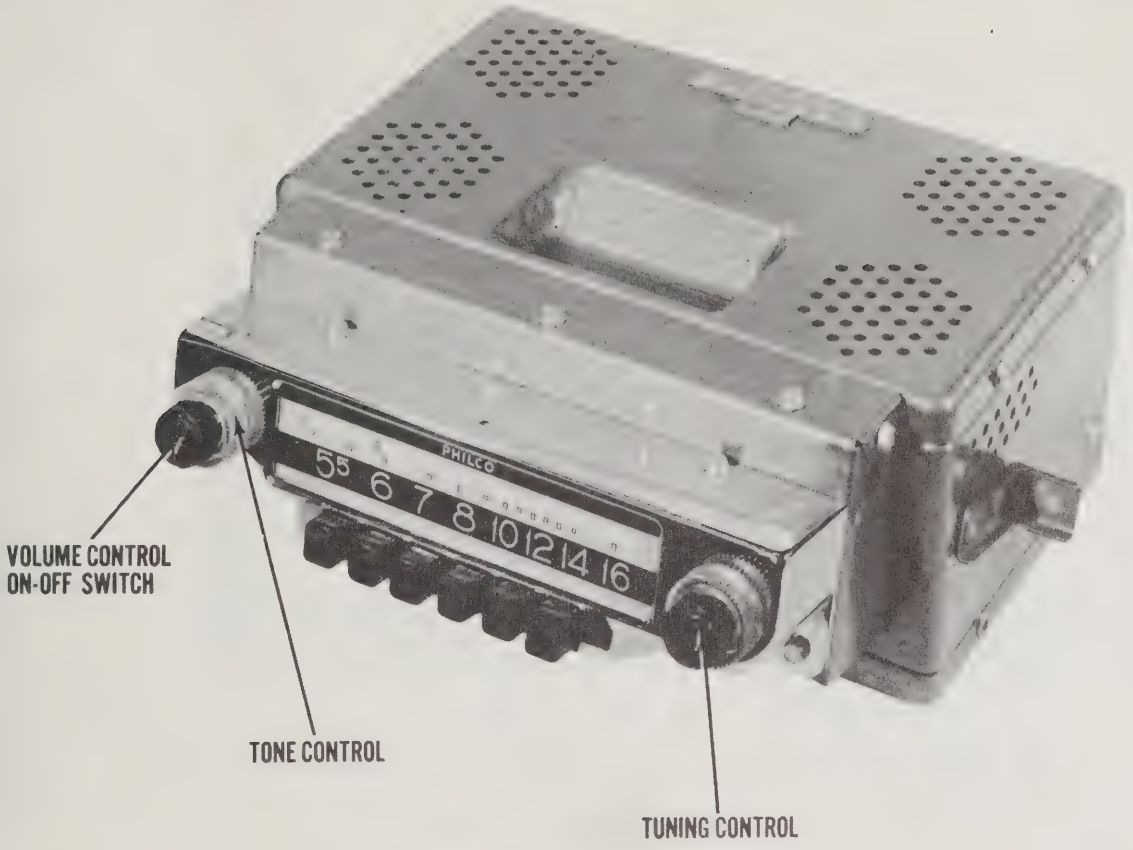
4814-16

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHILCO MODEL
CR-9



PHILCO MODEL
CR-9

PHILCO MODEL CR-9

TRADE NAME	Philco, Model CR-9
MANUFACTURER	Philco Corp., Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET	Battery Operated Universal Automotive Superheterodyne Receiver
TUBES (SIX)	Types, 6BA6 RF Amp., 6BE6 Converter, 6BA6 IF Amp., 6AV6 Det.-AVC-AF, 6AQ5 Power Output, 6X4 Rectifier.
POWER SUPPLY	6 Volt Storage Battery
TUNING RANGE—BROADCAST	535-1600KC RATING 7 Amp. @ 6.3 Volts DC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning slugs fully in and set pointer to index mark at left edge of dial. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.05 MFD	High side to Pin 7 (grid) of 6BE6. Low side to chassis.	455KC	Tuning slugs fully out.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. in order given.
2	.05 MFD	High side to ant. socket. Low side to chassis.	"		"	A5	Depress any button other than manual. Adjust A5 for minimum output.
3	2-30MMFD caps.	High side in series with one 30MMFD cap. to ant. receptacle. Connect the other 30MMFD cap. from ant. receptacle to chassis.	580KC	Depress manual button & tune for maximum output.	"	A6	Rock tuning control and adjust for maximum output.
4	"	"	1400KC	Tune for maximum output.	"	A7,A8	Adjust for maximum output. Repeat Steps 3 & 4 until no further improvement can be made.

After receiver has been installed in car adjust A8 for maximum volume on weak station about 1400KC.

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PARTS LIST AND DESCRIPTIONS

PHILCO MODEL CR-9

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	6BA6	6BA6	7BK	
2	Converter	6BE6	6BE6	7CH	
3	IF Amp.	6BA6	6BA6	7BK	
4	Det.-AVC-AF	6AV6	6AV6		
5	Power Output	6AQ5	6AQ5	7BZ	
6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	15	350	61-0089		UP1135C	DY-310	EL-153	■ Filter
B	10	350			BR435			▲ "
C	20	25						Cathode Bypass
8	.003	1500	61-0115	1684-.003	MD16D3	STM-16-003	TR-23	Buffer
9	.5	120	61-0137		DT2P5	SHH-1		Hash Filter
10	.5	120	61-0137		DT2P5	SHH-1		" "
11	.25	400	61-0125	484-.25	DT4P25	ST-4-25	TC-25	RF Bypass Pwr. Supply
12	.006	1000	61-0127	1084-.006	MD16D6	STM-16-006	TR-006	Output Plate Bypass
13	.01	400	61-0120	484-.01	DT4S1	ST-4-01	TC-11	Audio Coupling
14	.01	400	61-0120	484-.01	DT4S1	ST-4-01	TC-11	Tone Compensation
15	.01	400	61-0120	484-.01	DT4S1	ST-4-01	TC-11	" "
16	.004	600	45-3502	684-.004	DT6D4	ST-6-004	TC-24	Audio Coupling
17	.05	400	61-0122	484-.05	DT4S5	ST-4-05	TC-15	IF Screen Bypass
18	.05	200	61-0122	484-.05	DT2S5	ST-4-05	TC-15	IF Cathode Bypass
19	.05	200	61-0122	484-.05	DT2S5	ST-4-05	TC-15	RF Cathode Bypass
20	.05	200	61-0122	484-.05	DT2S5	ST-4-05	TC-15	AVC Filter
21	330	300	60-10335407	1468-.0003	5W5T3	MO.5-33	1FM-33	Hash Filter-Cer.
22	330	300	60-10335407	1468-.0003	5W5T3	MO.5-33	1FM-33	" " "
23	330	300	60-10335407	1468-.0003	5W5T3	MO.5-33	1FM-33	" " "
24	330	300	60-10335407	1468-.0003	5W5T3	MO.5-33	1FM-33	" " "
25	100	300	61-10105407	1468-.0001	5W5T1	MO.5-31	1FM-31	AF Plate Bypass-Cer.
26	100	300	61-10105407	1468-.0001	5W5T1	MO.5-31	1FM-31	Osc. Grid Cap.-Cer.
27	380	500	40-1220-37					Fixed Trimmer
28	54.5	300	61-0149					" " -Cer.
29	270	500	61-10275407					" "
30	100	500	60-10105407	1468-.0001	5W5T1	MO.5-31	1FM-31	RF Coupling

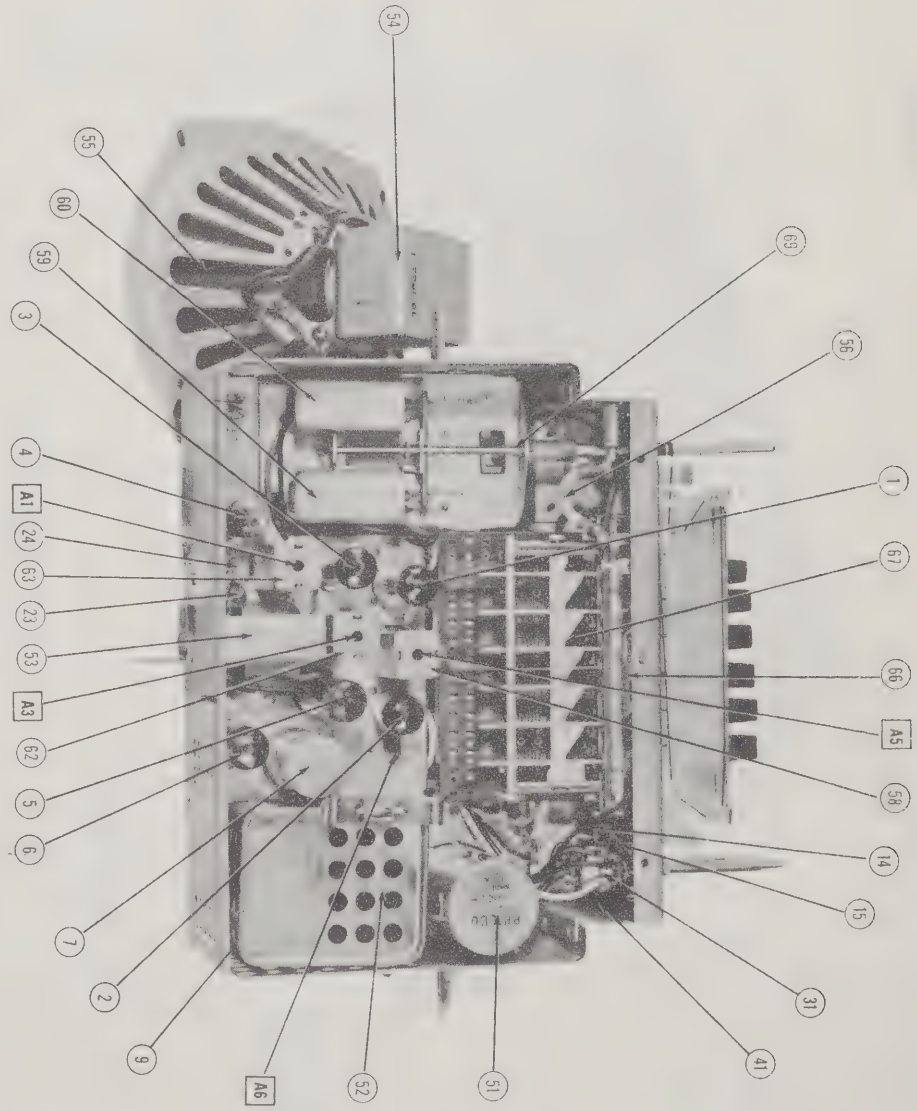
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
31A	350KΩ	½	33-5507-3			Volume Control & Switch tapped @ 35KΩ
B	5 Meg.	½	33-5507-3			Tone Control

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
32	1000Ω	½	66-2103340	BTS-1000	Br.-Blk.-Red RF Cathode
33	10KΩ	½	66-3104340	BTS-10K	Br.-Blk.-Or. RF Plate Load
34	100KΩ	½	66-4103340	BTS-100K	Br.-Blk.-Yl. Conv. Grid
35	330KΩ	½	66-4333340	BTS-330K	Or.-Or.-Yl. " "
36	22KΩ	½	66-3223340	BTS-22K	Red-Red-Or. Osc. Grid
37	2200Ω	½	66-2224340	BTS-2200	Red-Red-Red IF Cathode
38	27KΩ	1	66-3273350	BTA-27K	Red-Vi.-Or. Screen Dropping
39	27KΩ	½	66-3273340	BTS-27K	Red-Vi.-Or. Diode Filter
40	1 Meg.	½	66-5113340	BTS-1 Meg.	Br.-Blk.-Br. AVC Network

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	PHILCO PART No.	IRC PART No.	
41	33K Ω	½	66-3333340	BTS-33K	Or.-Or.-Or. Tone Compensation
42	10 Meg.	½	66-6103340	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
43	220K Ω	½	66-4223340	BTS-220K	Red-Red-Yl. AF Plate Load
44	470K Ω	½	66-4473340	BTS-470K	Yl.-Vl.-Yl. Output Grid
45	2200 Ω	1	66-1224340	BW-1-220	Red-Red-Br. Output Cathode
46	4700 Ω	½	66-2473340	BTS-4700	Yl.-Vl.-Red Voltage Dropping
47	10000 Ω	1	66-2104340	BTA-1000	Br.-Blk.-Red Filter
48	100 Ω	1	66-1104340	BW-1-100	Br.-Blk.-Br. Hash Supp.
49	100 Ω	1	66-1104340	BW-1-100	Br.-Blk.-Br. " "
50	33000 Ω	½		BTS-33000	Or.-Or.-Red Band Pass Comp. Resistor

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA		INSTALLATION NOTES
				PHILCO PART No.	RADIART PART No.	
51	Interrupter	6.3V DC	115V.	83-0026	5326P	

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	PHILCO PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
52	6.3V DC @ 3.2A	510V CT @ .052A DC			38-8314-2			

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		PHILCO PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
53	5800Ω	3.3Ω	430Ω	.4Ω	63-0317	A-3877*	T22846*	A-2930*	*Drill new mounting holes.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			PHILCO PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD RES.	VC IMP.				
54A	4.1Ω	3.3Ω	36-1622-1		69EV6	
B	FM		36-1622-2			
	CONE DIA.	VC DIA.				
55	6x9"	3/4"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	
56	Ant. Coil		7.5Ω	65-0439		
57	Ant. Coil		10.9Ω	76-3348		
58	RF & Wave Trap Trans.	33Ω†	25.3Ω	32-4162		†Wave trap resistance
59	RF Coil		2.1Ω	76-3348		

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PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	
60	Osc. Coil		10.8Ω	76-3348		
61	Osc. Shunt Coil		5.8Ω	32-4110		
62	Input IF	11Ω	11Ω	32-4160	16-6668	
63	Output IF	12.8Ω	13.2Ω	32-4240	16-6669	
64	Hash Choke		0Ω	65-0037		
65	" "		0Ω	32-4170		

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					PHILCO PART No.		
66	Bayonet	6-8	0.25	Blue	34-2064		Type 44

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
67	Pushbutton Assy.	76-3349	
68	Fuse	45-2559	14 Amp.
69	Tuning Assy.	76-3349	
A7 } A8 }	Trimmer Strip	63-0035-6	{Ant. Adj. {RF Adj.
	Dial Scale	27-5983	
	Pointer	56-4362FCP	

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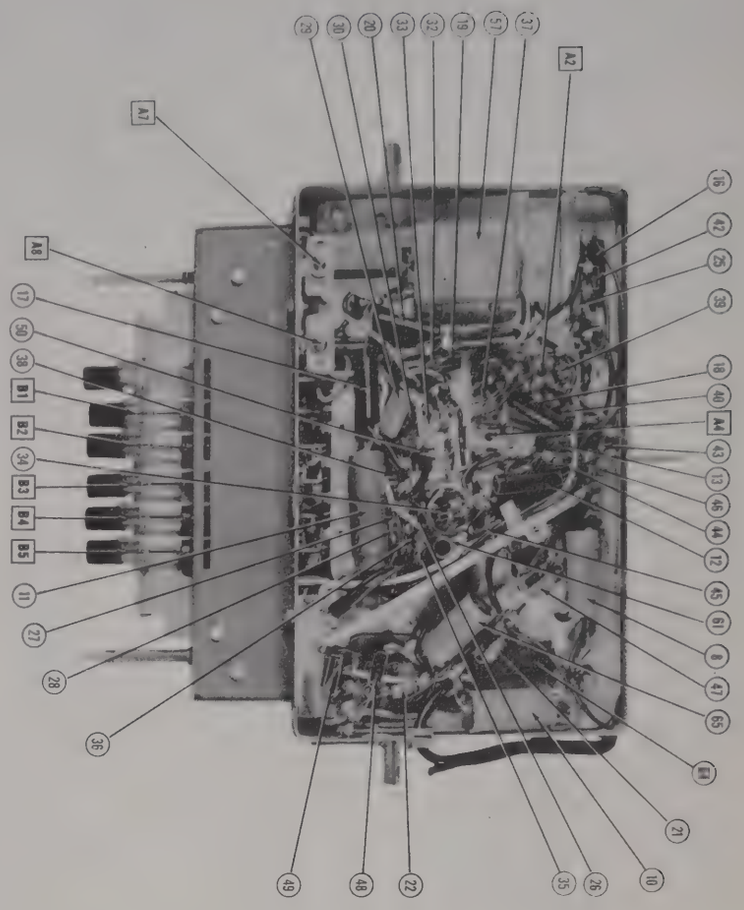
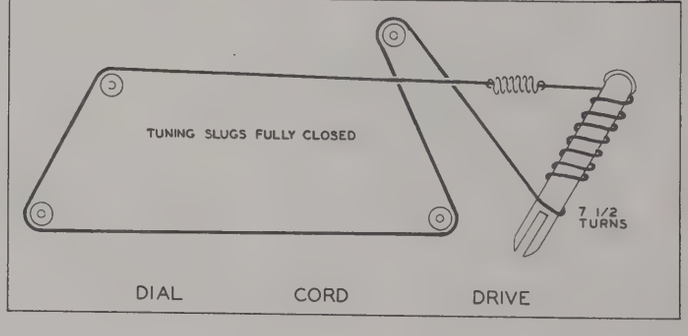
CHASSIS—BOTTOM VIEW



PUSHBUTTON ADJUSTMENTS

The frequency ranges for the five buttons in order from left to right are: 850-1600KC, 750-1400KC, 700-1300KC, 650-1150KC and 540-1000KC.

1. Turn receiver on and allow it to warm up for at least 15 minutes.
2. Make up a list of stations desired to be set up making sure that each station falls within the frequency range of its button.
3. Remove the caps from all five buttons.
4. Depress manual button and manually tune in the station selected for button #5.
5. Depress button #5 and adjust B1 for maximum volume on selected station.
6. Replace cap on this button. This button is now set up.
7. To set up the remaining buttons follow the procedure outlined above.



STAGE GAIN MEASUREMENTS		
RF GRID TO CONVERTER GRID	3X	600KC
CONV. GAIN	18X	IN 600KC OUT 455KC
INPUT IF TRANS.	1.5X	455KC
IF TUBE	50X	455KC
OUTPUT IF TRANS.	.8X	455KC
AUDIO	45X	400 ∿
OUTPUT	30X	400 ∿

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurment operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment etc., that an absolute reading is impractical. AVC is made inoperative by connecting negative (-) 3 volts to the AVC line.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	6BA6	-.2VDC	0V.	6.3VDC	0V.	160VDC	65VDC	2.8VDC
2	6BE6	-4VDC§	0V.	6.3VDC	0V.	210VDC	65VDC	0V.
3	6BA6	0V.	0V.	6.3VDC	0V.	210VDC	65VDC	3.8VDC
4	6AV6	-.5VDC	0V.	6.3VDC	0V.	-.6VDC	-.6VDC	96VDC
5	6AQ5	0V.	6.4VDC	6.3VDC	0V.	210VDC	215VDC	0V.
6	6X4	255VAC	0V.	6.3VDC	0V.	0V.	255VAC	225VDC

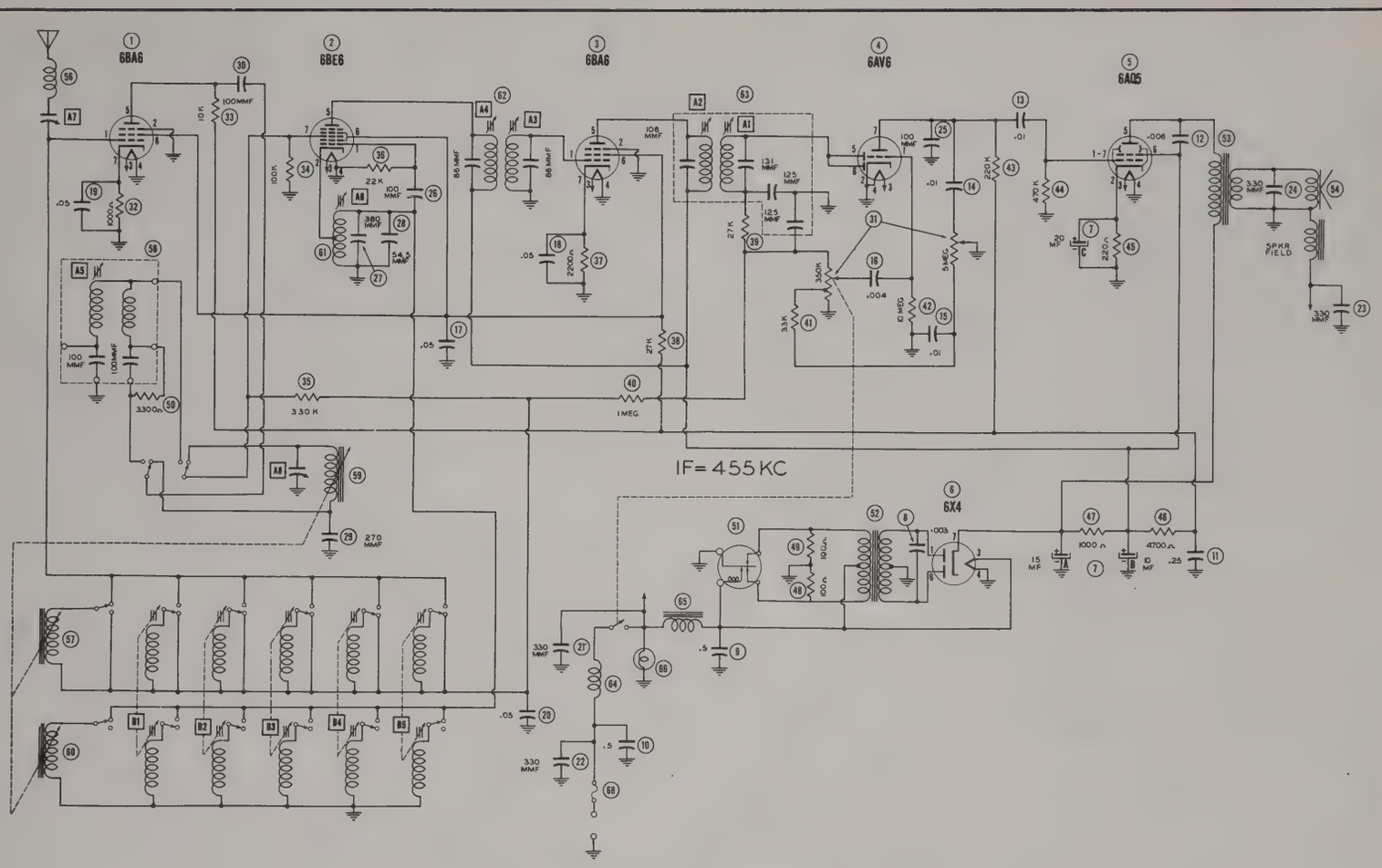
§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	6BA6	300KΩ	0Ω	.1Ω	0Ω	160KΩ	180KΩ	1KΩ
2	6BE6	22KΩ	1Ω	.1Ω	0Ω	150KΩ	150KΩ	100KΩ
3	6BA6	11Ω	0Ω	.1Ω	0Ω	150KΩ	180KΩ	2.2KΩ
4	6AV6	10 Meg.	0Ω	.1Ω	0Ω	365KΩ	380KΩ	370KΩ
5	6AQ5	470KΩ	220Ω	.1Ω	0Ω	150KΩ	150KΩ	470KΩ
6	6X4	400Ω	INF.	.1Ω	0Ω	INF.	450Ω	150KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.



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RCA (VICTOR) MODEL 8BX6

TRADE NAME	RCA (Victor), Model 8BX6 (Ch. RC-1040C)
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, N.J.
TYPE SET	Three Power Operated Portable Superheterodyne Receiver with Loop Antenna
TUBES (SIX)	Types, 1T4 RF Amp., 1R5 Converter, 1T4 IF Amp., 1U5 Det.-AVC-AF, 3V4 Power Output, 117Z3 Rectifier.
POWER SUPPLY RATING	110-125 Volts AC-DC or 9 Volt "A" Supply and 90 Volt "B" Supply in Pack Form .16 Amp. @ 117 Volts AC or 56MA @ 9 Volts DC and 10MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial pointer turn tuning cap. fully closed and set pointer to extreme left hand edge of the first figure of the number 55 on dial scale.
Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1 MFD capacitor in series with low side of the signal generator and B-.

ALIGNMENT USING AM SIGNAL GENERATOR AND OSCILLOSCOPE

Use freq. modulated signal with 60 ∿ modulation and 40KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01 MFD	High side to Pin 6 (grid) of 1T4. IF Tube (3). Low side to chassis.	455KC (Freq. Mod.)	Tuning cap. fully open.	Vertical input to Point A. Ground to chassis.	A1,A2.	Connect shorting wire from Pin 4 to Pin 1 of 1R5. Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. Two patterns may be obtained when adjusting A1. Use pattern obtained with peak furthest out. (Counter clockwise)
2	.01 MFD	High side to Pin 6 (grid) of 1R5. Low side to chassis.	"	"	"	A3,A4.	Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. Two patterns may be obtained when adjusting A3. Use pattern obtained with core furthest out. (Counter-clockwise). Remove short from Pins 1 & 4 of 1R5.
3	.01 MFD	High side to stator of large section of tuning cap. Low side to chassis. (Bottom shield in place on chassis).	1600KC	1600KC	"	A5	Adjust for coincidence of pattern per Fig. 1.
4	.01 MFD	"	1400KC	Tune for coincidence.	"	A6	Adjust for maximum amplitude of pattern per Fig. 1.
5	.01 MFD	"	600KC	600KC	"	A7,A8	Alternately adjust A7 for coincidence and A8 for maximum amplitude of pattern per Fig. 1. Repeat Steps 3, 4 and 5 until no further improvement can be made. Reassemble receiver in cabinet.
6		Loop	1400KC	Tune for maximum output.		A9	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust A9 for maximum volume.

FIG. 1

CRITICAL LEAD DRESS

1. Dress all filament leads next to chassis.
2. Keep the leads short on the ends of capacitor (27), resistor (30) and resistor (31) where they connect to Pin 6 (grid) of 1T4 RF Tube (1).
3. Keep lead to center section of tuning cap. as short as possible.
4. Dress loop leads away from tuning drum and battery.
5. Dress lead to Pin 4 (Diode) of 1U5 away from other wiring.
6. Dress RF Plate lead away from RF Grid circuit.
7. Dress components and wiring near external loop socket to clear external loop pins.
8. Dress AVC lead away from 2nd IF Transformer (57) and associated components.
9. Dress converter plate lead away from chassis and away from output leads.
10. Dress output leads up and away from other wiring.
11. Dress capacitor (24) flat against chassis.
12. Dress AF Plate lead up and away from other wiring.
13. Dress resistor (48) over bottom of rectifier socket and clear of other wiring.
14. Dress RF Plate lead slightly away from chassis.

FOR ALTERNATE METHOD OF ALIGNMENT SEE PAGE 4 OF THIS FOLDER.

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DATE 8/48-#4814-18 SET #44-FOLDER #18

RCA (VICTOR) MODEL
8BX6 (Ch. RC-1040C)

RCA (VICTOR) MODEL
8BX6 (Ch. RC-1040C)

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	1T4	1T4	6AR	
2	Converter	1R5	1R5	7AT	
3	IF Amp.	1T4	1T4	6AR	
4	Det.-AVC-AF	1U5	1U5	6BW	
5	Power Output	3V4	3V4	6BX	
6	Rectifier	117Z3	117Z3	4BR	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RCA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	50	150	73113	AF101010D4A	UP7DJ63	DY-410	EL-434	◓ Filter
B	20	150		PRS25/100	BR502	M-100-25	UHC-102	■ "
C	160	25						▲ Filament Bypass
D	40	25						" "
8	.05	400	70615	484-05	DT4S5	ST-4-05	TC-15	Rectifier Bypass
9	.005	400	71553	484-005	DT6D5	ST-6-005	TC-25	Output Plate Bypass
10	.002	400	71552	484-002	DT6D2	ST-6-002	TC-22	Audio Coupling
11	.02	200	70611	484-02	DT2S2	ST-4-02	TC-12	AF Screen Bypass
12	.01	400	70610	484-01	DT4S1	ST-4-01	TC-11	RF Bypass Pwr. Supply
13	.002	400	71552	484-002	DT6D2	ST-6-002	TC-22	Audio Coupling
14	.1	400	70617	484-.1	DT4P1	ST-4-1	72P2	Line Isolation
15	.0025	400	70602	484-003	DT6D3	ST-6-003	TC-23	Shield Isolation
16	.05	200	71551	484-05	DT2S5	ST-4-05	TC-15	Filament Bypass
17	.05	200	71551	484-05	DT2S5	ST-4-05	TC-15	" "
18	.003	200	71921	484-003	DT6D3	ST-6-003	TC-23	IF Grid Filter
19	.05	400	70615	484-05	DT4S5	ST-4-05	TC-15	Screen Bypass
20	.05	200	71551	484-05	DT2S5	ST-4-05	TC-15	Filament Bypass
21	.05	400	70615	484-05	DT4S5	ST-4-05	TC-15	AVC Filter
22	270	300	71540	1468-00025	5W5T25	M0.5-325	1FM-325	AF Plate Bypass-Cer.
23	82	300	71514	1468-000075	5W5Q7	M0S.5-47	1FM-475	Diode RF Filter-Cer.
24	4	300	73153					Feedback-Cer.
25	56	300	71924	1468-00005	5W5Q5	M0.5-45	1FM-45	Osc. Grid Cap.-Cer.
26	2.2	300	71502					RF Coupling-Cer.
27	82	300	71514	1468-000075	5W5Q7	M0S.5-47	1FM-475	" " "
28	6.8	300						Fixed Trimmer-Cer.

CONTROLS

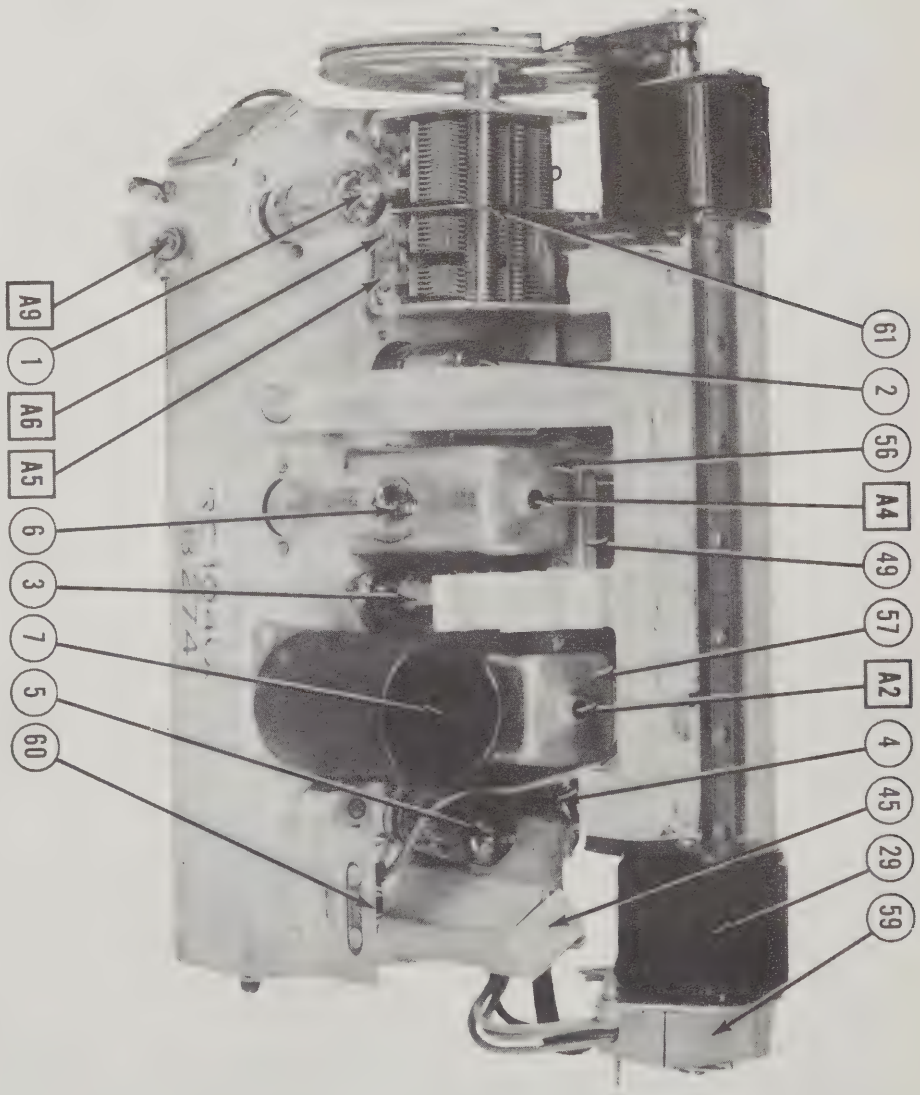
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
29	1 Meg.	½	71057		15/16-63-2*	Volume control

*File shaft to duplicate original.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
30	4.7 Meg.	½		BTS-4.7 Meg.	Yl.-Vi.-Grn. RF Grid
31	4.7 Meg.	½		BTS-4.7 Meg.	Yl.-Vi.-Grn. " "
32	2700Ω	½		BTS-2700	Red-Vi.-Red Filament Dropping
33	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Osc. Grid
34	1800Ω	½		BTS-1800	Br.-Gray-Red Filament String
35	5.6 Meg.	½		BTS-5.6 Meg.	Grn.-Blue-Grn. IF Grid
36	3.3 Meg.	½		BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
37	68KΩ	½		BTS-68K	Blue-Gray-Or. Diode Filter
38	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue AF Grid
39	4.7 Meg.	½		BTS-4.7 Meg.	Yl.-Vi.-Grn. AF Screen
40	220KΩ	½		BTS-220K	Red-Red-Yl. AF Plate Load

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	RCA PART No.	IRC PART No.	
41	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. Output Grid
42	180Ω	½		BTS-180	Br.-Gray-Red Filament Shunt
43	1500Ω	½		BTS-1500	Br.-Grn.-Red " "
44	27KΩ	½		BTS-27K	Red-Vi.-Or. Voltage Dropping
45	2200Ω	6	73230	AB-2250	Filament Dropping
46	15KΩ	½		BTS-15K	Br.-Grn.-Or. Bleeder
47	1500Ω	1		BTA-1500	Br.-Grn.-Red Filter
48	35Ω		73247		Rect. Ballast

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		RCA PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
49	10000Ω	3.8Ω	500Ω	.7Ω	71047	A-3879	T22847	A-2932	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			RCA PART No.	JENSEN PART No.	QUAM PART No.	
50A	FIELD PM	VC IMP. 3.8Ω	73123	ST-113♯ Mod. P4-X	4A15♯	
51A	CONE DIA. 4"	VC DIA. 1/2"				
50B	FIELD PM	VC DIA. 3.5Ω	71058		46A1♯	♯Drill and tap magnet frame.
51B	CONE DIA. 4x6"	VC DIA. 1/2"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	RCA PART No.	MEISSNER PART No.	
52	Loop Ant. (Int.)		3.2Ω	71079		
53	Loop Ant. (Ext.)					
54	RF Coil	50Ω	6.5Ω	73176		
55	Osc. Coil	2.5Ω	8.5Ω	73114	14-1060	
56	Input IF	17Ω	17Ω	73174	16-6666	
57	Output IF	16Ω	16Ω	73175	16-6667	

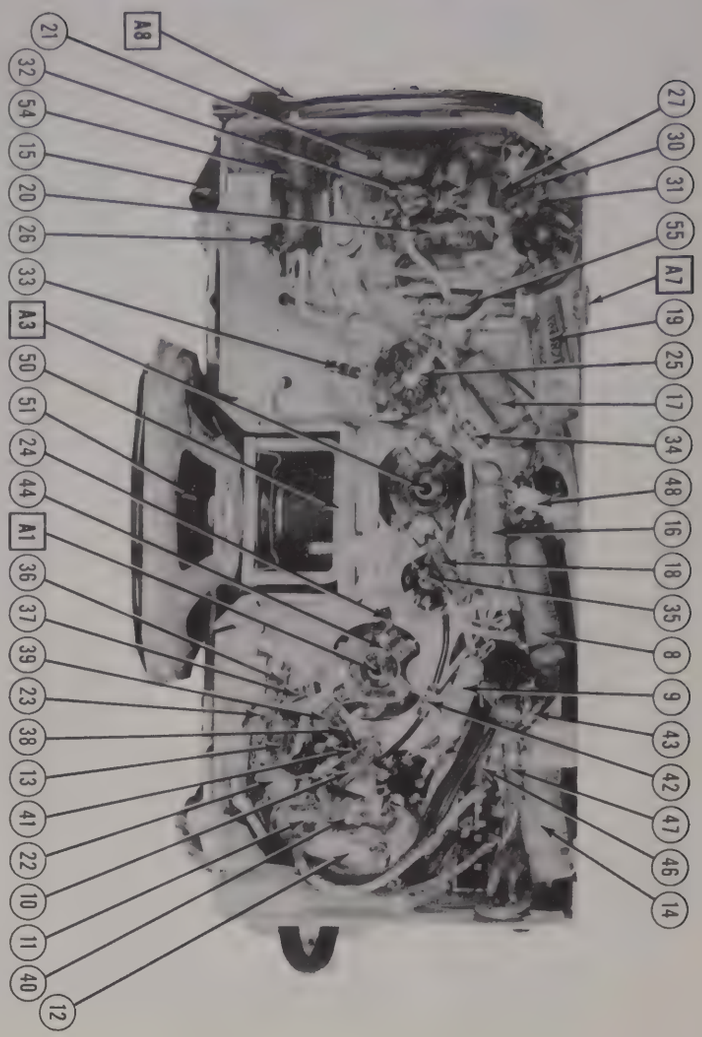
BATTERIES

ITEM No.	VOLTAGE	RCA PART No.	REPLACEMENT DATA.						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
58	9V "A" 90V "B"	VS019			753			F6A60	

MISCELLANEOUS

ITEM No.	PART NAME	RCA PART No.	NOTES
59	Switch	71045	On-Off
60	"	71039	AC/DC Batt.
61	3 Gang Var. Cap.	73112	(13-486MMF, 12-211MMF, 15-107MMF)
	Dial Scale	73118	Includes Window
	Dial Window	71049	
	Knob	73121	

CHASSIS—BOTTOM VIEW



INSULATING WASHERS:

The mounting bracket and dial frame are insulated from the chassis with insulating washers. This serves to insulate the case from the chassis. In servicing make certain that these washers are in place and properly positioned.

TO REMOVE CHASSIS FROM CABINET:

1. Disconnect battery plug and remove battery.
2. Disconnect antenna in cabinet.
3. Remove the two screws in the top of the cabinet (beneath handle).
4. Remove the two battery clips.
5. Remove the chassis from the cabinet.

TO REMOVE SPEAKER.

1. Remove tubes 3V4 and 1U5.
2. Remove the three screws holding power cord bracket assembly and remove bracket.
3. Remove the three screws holding speaker bracket assembly.
4. Disconnect voice coil leads.
5. The speaker and speaker bracket may now be removed.

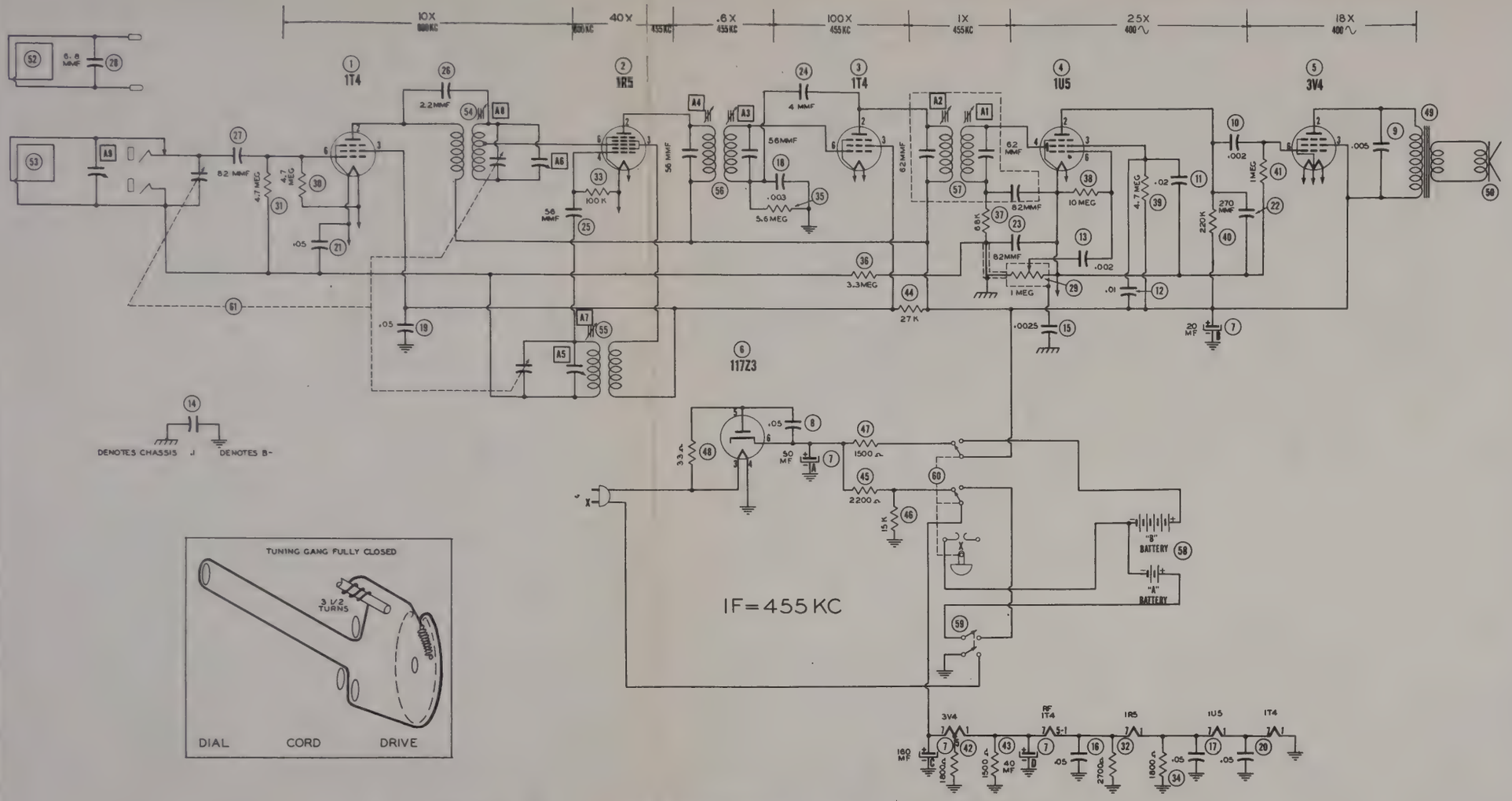
ALIGNMENT USING AM SIGNAL GENERATOR AND OUTPUT METER

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01 MFD.	High side to Pin 6 (grid) of 1T4. IF Tube (3). Low side to chassis.	455KC (400 ∿ Amp.Mod.	Tuning cap. fully open.	Across voice coil	A1,A2	Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy ant. to 200MMF to reduce hum modulation. In adjusting A1 two peaks may be obtained. Use the peak obtained with core furthest out counter-clockwise).
2	.01 MFD	High side to Pin 6 (grid) of 1R5. Low side to chassis.	"	"	"	A3,A4.	Adjust for maximum output. In adjusting A3 two peaks may be obtained. Use peak obtained with core furthest out. (Counter-clockwise).
2	.01 MFD	High side to stator of large section of tuning cap. Low side to chassis. (Bottom shield in place on chassis.)	1600KC	1600KC	"	A5	Adjust for maximum output.
3	.01 MFD	"	1400KC	Tune for maximum output.	"	A6	" " " "
4	.01 MFD	"	600KC	600KC	"	A7	" " " "
5	.01 MFD	"	"	Tune for maximum output.	"	A8	Rock tuning cap. and adjust for maximum output. Repeat Steps 2, 3, 4 & 5 until no further improvement can be made. Reassemble receiver in cabinet.
6		Loop	1400KC	"		A9	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust A9 for maximum volume.

FOR ALTERNATE METHOD OF ALIGNMENT SEE FRONT PAGE OF THIS FOLDER

DATE 8/48-#4814-10 SET #44-FOLDER #18



VOLTAGE AND RESISTANCE READINGS TAKEN IN AC-DC POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1T4	4.8VDC	95VDC	35VDC	0V.	4.8VDC	.2VDC	6.4VDC
2	1R5	3.2VDC	95VDC	35VDC	-12VDC§	3.2VDC	.2VDC	4.8VDC
3	1T4	0V.	95VDC	35VDC	0V.	0V.	0V.	1.5VDC
4	1U5	1.5VDC	65VDC	20VDC	.2VDC	0V.	0V.	3.2VDC
5	3V4	6.4VDC	90VDC	95VDC	0V.	8VDC	.2VDC	9.6VDC
6	117Z3	0V.	0V.	117VAC	0V.	115VAC	120VDC	0V.

§TAKEN WITH VACUUM TUBE VOLTMETER.

§OSC. VOLTAGE MEASURED FROM OSC. GRID TO PIN 1 OF 1R5.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1T4	*	3.7KΩ	31KΩ	INF.	*	3.5 Meg.	*
2	1R5	*	3.7KΩ	31KΩ	100KΩ	*	3 Meg.	*
3	1T4	OΩ	3.7KΩ	31KΩ	INF.	OΩ	5 Meg.	*
4	1U5	*	220KΩ	4.7 Meg.	1 Meg.	INF.	10 Meg.	*
5	3V4	*	4KΩ	3.7KΩ	INF.	*	1 Meg.	*
6	117Z3	INF.	INF.	460Ω	OΩ	490Ω	2.2KΩ	OΩ

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by shorting AVC to Pin 1 of 1U5.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volts.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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REMLER MODELS 5400, 5410
BATTERY-LINE OPERATED

REMLER MODELS 5400, 5410
BATTERY-LINE OPERATED

REMLER MODEL 5400

TRADE NAME	Remler, Models 5400, 5410
MANUFACTURER	Remler Co., Ltd., 2101 Bryand St., San Francisco, Calif.
TYPE SET	Three Power Operated Portable Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types, 1R5 Converter, 1T4 IF Amp., 1S5 Det.-AVC-AF, 3V4 Power Output, 117Z3 Rectifier.
POWER SUPPLY	110-120 Volts AC-DC or 7.5 Volts "A" Supply and 67.5 Volts "B" Supply
RATING	.18 Amp. @ 117 Volts AC or 58 MA @ 7.5 Volts DC and 14MA @ 67.5 Volts DC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1 MFD capacitor in series with low side of the signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD	High side to Pin 6 (grid) of 1R5. Low side to B-.	450KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy ant. to 200 MMF. to reduce hum modulation.
2		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1400KC	"	"	A6	Adjust for maximum output.

HOWARD W. SAMS & CO., INC. **Indianapolis Indiana**

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PARTS LIST AND DESCRIPTIONS

REMLER MODELS 5400, 5410

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: REMLER PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASF TYPE	INSTALLATION NOTES
1	Converter	1R5	1R5	7AT	
2	IF Amp.	1T4	1T4	6AR	
3	Det.-AVC-AF	1S5	1S5	6AU	
4	Power Output	3V4	3V4	6BX	
5	Rectifier	11Z3	11Z3	4BR	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: REMLER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	40	150	L-10158	PRSA150/40-40	BRD4415	DSB-2x40-150	TA-440	Filter
B	40	150						"
7	100	25	L-10133	PRS100/25	BRH251	M-100-25	UHC-102	Filament Bypass
8	.05	600		684-05	DT6S5	ST-6-05	TC-15	Line Filter
9	.1	200		484-.1	DT4P2	ST-2-1	TC-1	RF Bypass Pwr. Supply
10	.2	200		484-.2	DT2P2	ST-2-2	72P3	Line Isolation
11	.004	600		684-004	DT6D4	ST-6-004	TC-24	Output Plate Bypass-Note
12	.01	600		684-01	DT6S1	ST-6-01	TC-11	Audio Coupling
13	.05	200		484-05	DT2S5	ST-4-05	TC-15	AF Screen Bypass
14	.004	600		684-004	DT6D4	ST-6-004	TC-24	Audio Coupling
15	.2	200		484-.2	DT2P2	ST-2-2	TC-2	Filament Bypass
16	.05	200		484-05	DT2S5	ST-4-05	TC-15	AVC Filter
17	250	500		1468-00025	5W5T25	MO.5-325	1FM-325	AF Plate Bypass
18	250	500		1468-00025	5W5T25	MO.5-325	1FM-325	Diode RF Filter
19	70	500		1469-00007	5W5Q7	MOS.5-47	MS-47	Osc. Grid Cap.

Note-Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: REMLER PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
20A	1 Meg.	½	L-20384	D13-137	M-63-Z	Volume Control
B	Shaft		Not Req.	A	Not Req.	Attach to 20A per instructions
C	Switch		" "	42	SW-A2	" " " " "

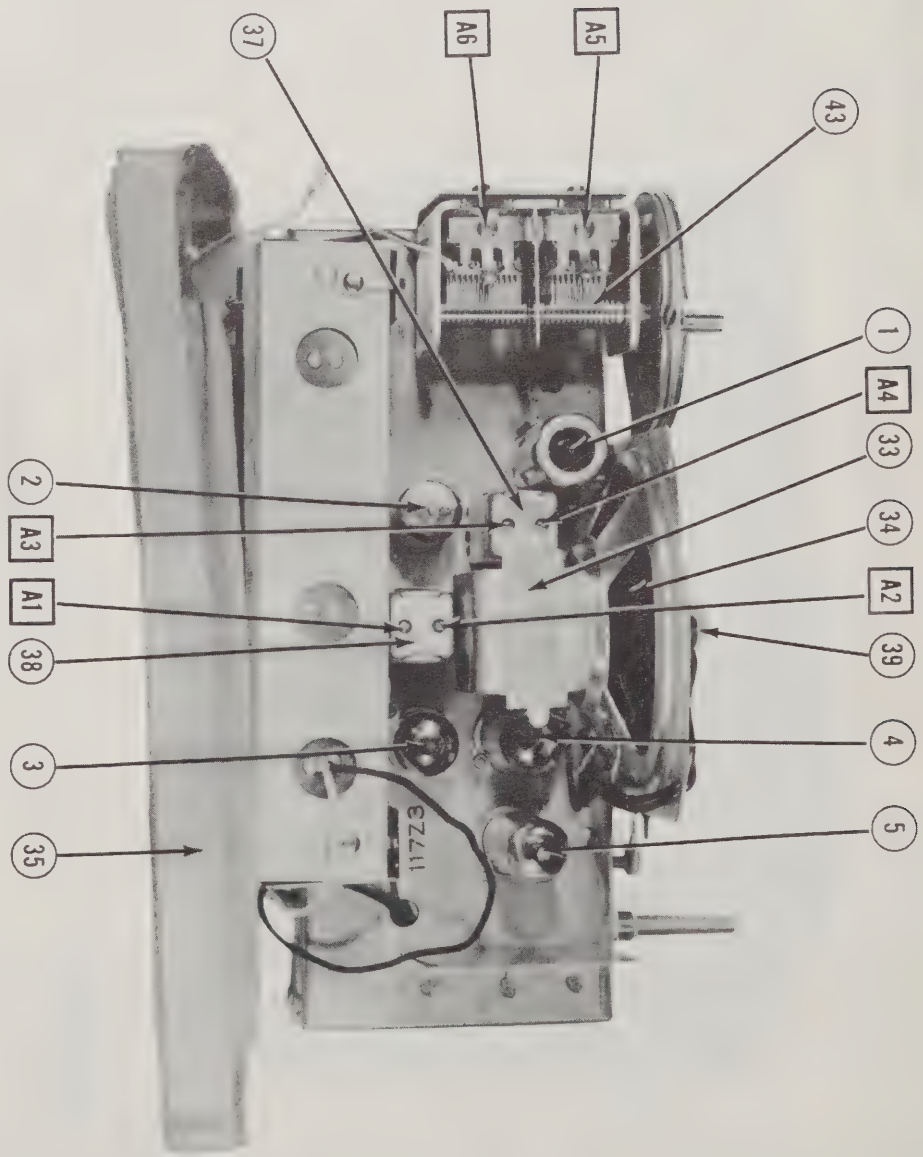
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: REMLER PART No.	IRC PART No.	IDENTIFICATION CODES
21	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Osc. Grid
22	4.7 Meg.	½		BTS-4.7 Meg.	Yl.-Vi.-Grn. AVC Network
23	6.8 Meg.	½		BTS-6.8 Meg.	Blue-Gray-Grn. AF Grid
24	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. AF Screen
25	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. AF Plate Load
26	220KΩ	½		BTS-220K	Red-Red-Yl. Output Grid
27	680Ω	½		BTS-680	Blue-Gray-Br. Filament String
28	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Line Isolation
29	1800Ω	10		ABA-2000	Br.-Gray-Red Filament Dropping
30	2200Ω	1		BTA-2200	Red-Red-Red Filter
31	47Ω	½		BW-½-47	Yl.-Vi.-Blk. Surge Limiter

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: REMLER PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	INSTALLATION NOTES
32	19KΩ	3.2Ω	110Ω	.7Ω	L-30258	A-3881#	T22S48#	A-2999#	#Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: REMLER PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
33	FIELD PM	VC IMP. 3.2Ω	L-100092-1	ST-113 Mod. P4-X	4A07	
34	CONE DIA. 4"	VC DIA. 1/2"				

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: REMLER PART No.	REPLACEMENT DATA: MEISSNER PART No.	
35	Loop Ant.		1.7Ω	L-30298		
36	Osc. Coil	.7Ω	5.8Ω	L-30230	14-1060*	*Add 50 MMFD from high side of tuning cap. to osc. grid.
37	Input IF	18.2Ω	18.2Ω	L-30299-1	16-6668	
38	Output IF	22.8Ω	22.8Ω	L-30299-2	16-6669	

DIAL LIGHT

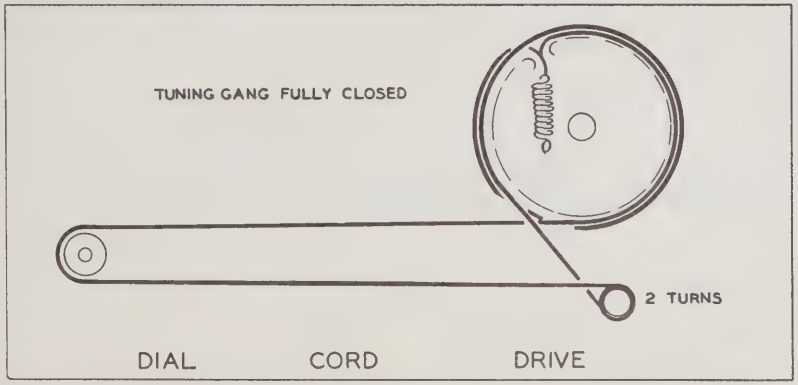
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: REMLER PART No.	REPLACEMENT DATA	INSTALLATION NOTES
39	Bayonet	6-8	0.15	Brown	L-60030		Type 47

BATTERIES

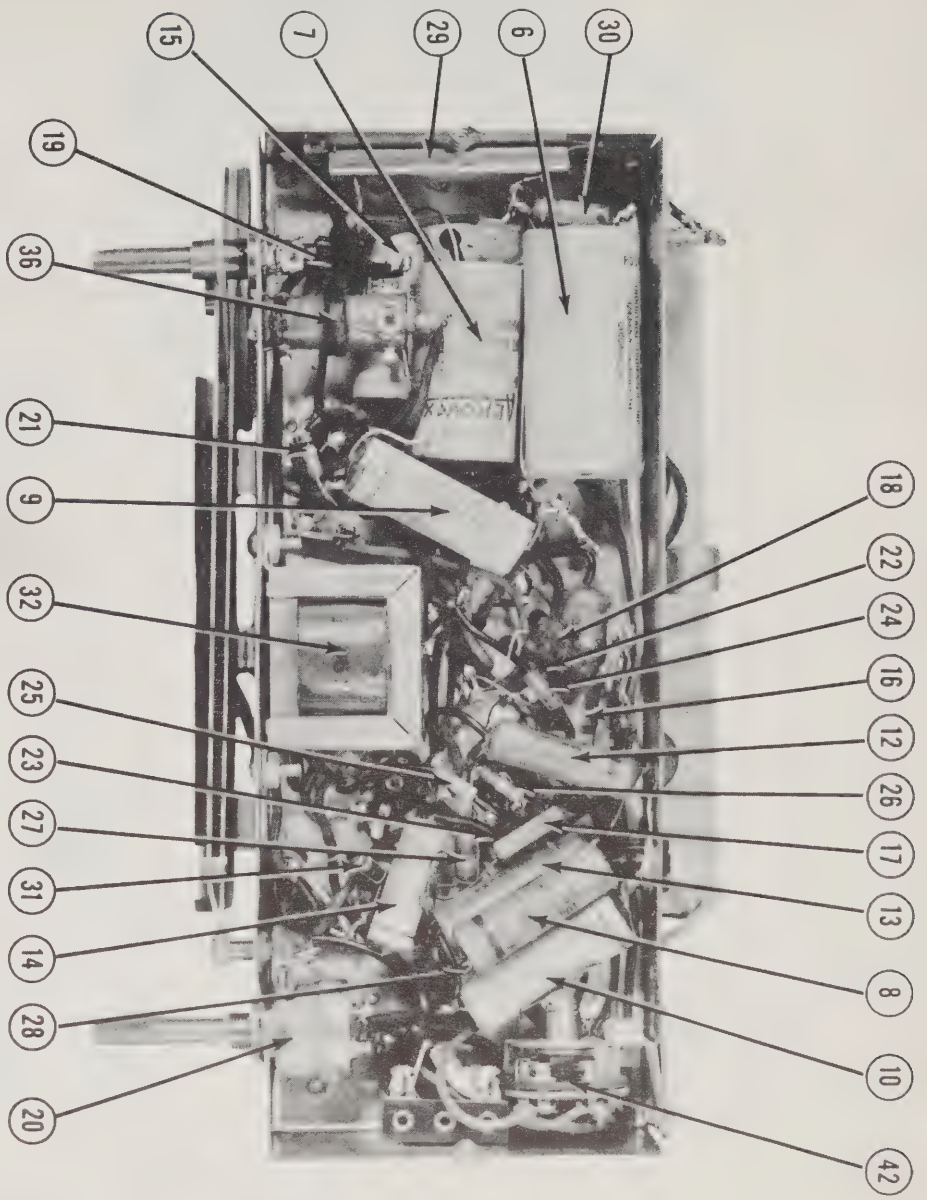
ITEM No.	VOLTAGE	REMLER PART No.	REPLACEMENT DATA: EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
40 41	7.5V "A" 67.5V "B"		950	467		2R	XX45		5 Used in series

MISCELLANEOUS

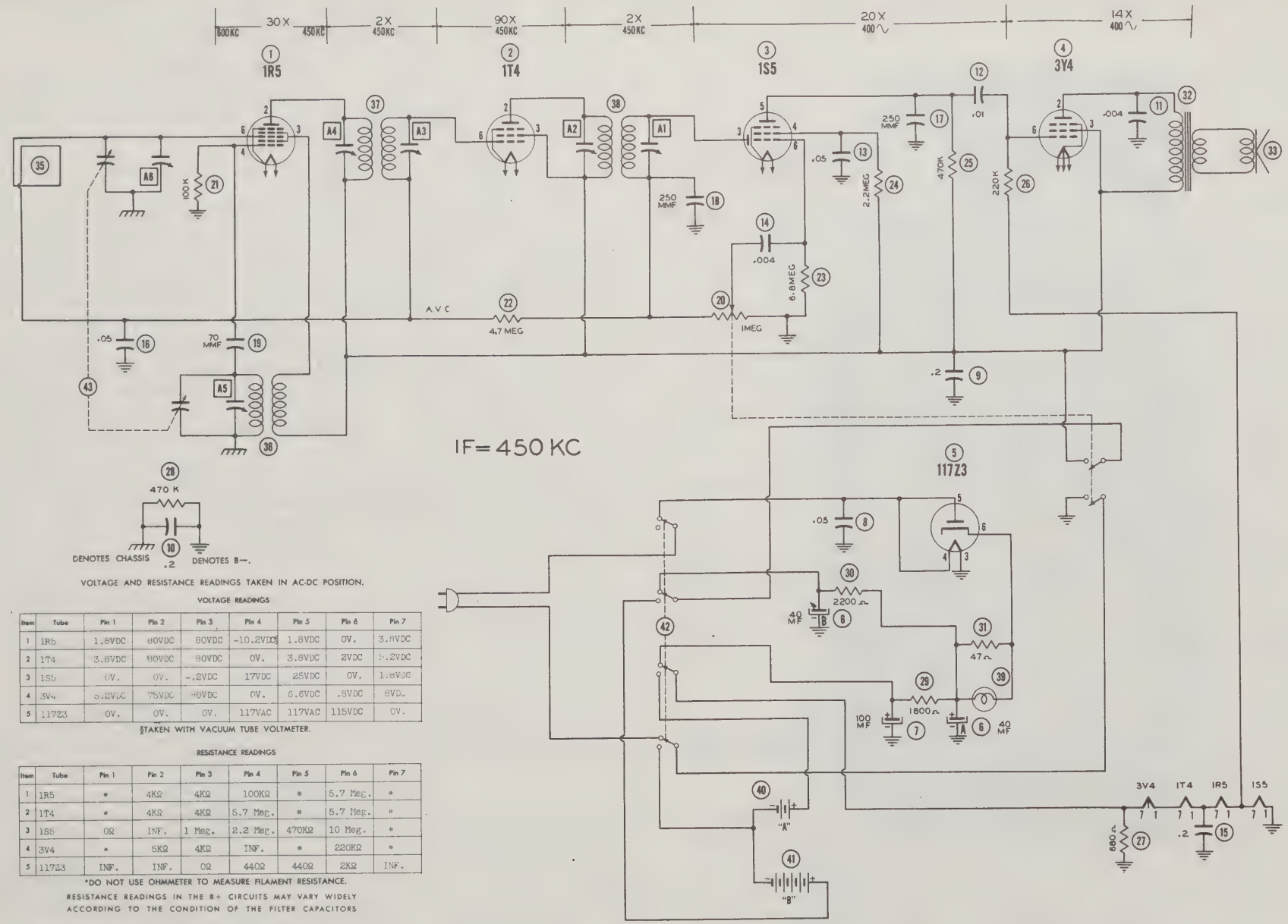
ITEM No.	PART NAME	REMLER PART No.	NOTES
42	Switch	L-40193	AC-DC-Batt.
43	2 Gang Var. Cap.		(40-475MMF, 30-200MMF)
	Dial Scale	W-72588-1	
	Dial Pointer	L-72277-4	
	Tuning Knob	L-72596	Specify Color
	Handle	L-72608	



CHASSIS—BOTTOM VIEW



REMLER MODELS 5400, 5410



VOLTAGE AND RESISTANCE READINGS TAKEN IN AC-DC POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	1.8VDC	80VDC	80VDC	-10.2VDC	1.8VDC	0V.	3.8VDC
2	1T4	3.8VDC	90VDC	80VDC	0V.	3.8VDC	2VDC	8.2VDC
3	1S5	0V.	0V.	-.2VDC	17VDC	25VDC	0V.	1.8VDC
4	3V4	8.2VDC	75VDC	80VDC	0V.	6.6VDC	.8VDC	8VDC
5	117Z3	0V.	0V.	0V.	117VAC	117VAC	115VDC	0V.

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	*	4KΩ	4KΩ	100KΩ	*	5.7 Meg.	*
2	1T4	*	4KΩ	4KΩ	5.7 Meg.	*	5.7 Meg.	*
3	1S5	0Ω	INF.	1 Meg.	2.2 Meg.	470KΩ	10 Meg.	*
4	3V4	*	5KΩ	4KΩ	INF.	*	220KΩ	*
5	117Z3	INF.	INF.	0Ω	440Ω	440Ω	2KΩ	INF.

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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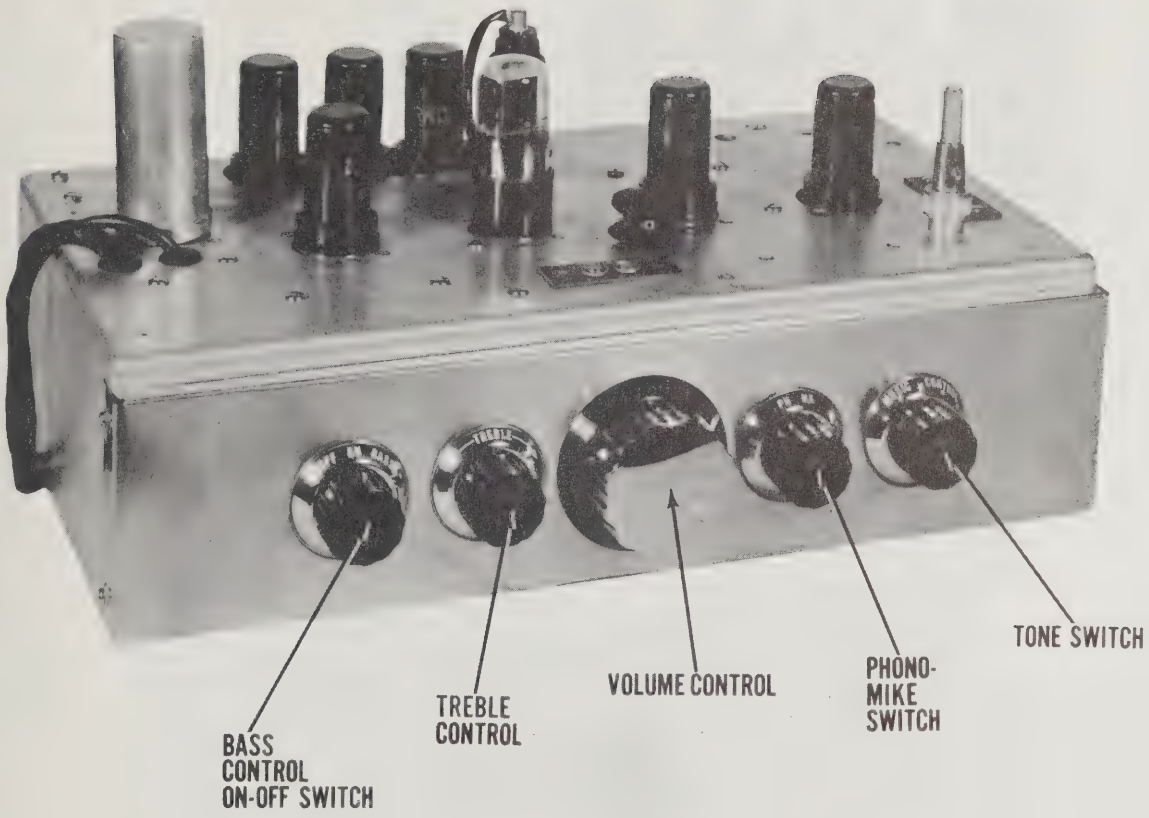
4814-19

The stage gain measured values listed above are approximate values for an average operative stage rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by shorting AVC to B-.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volts.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

SCOTT MODEL
MUSICALE



SCOTT MODEL
MUSICALE

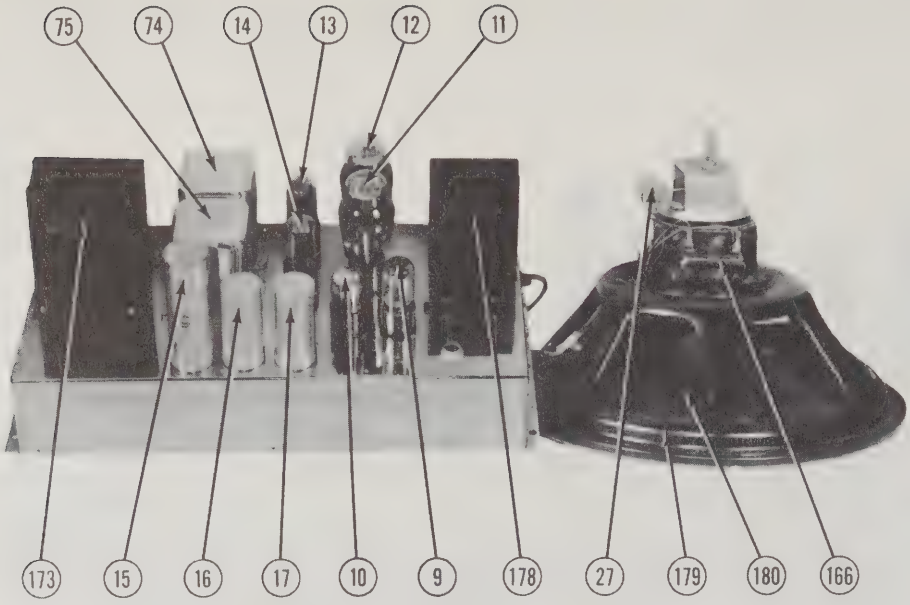
SCOTT MUSICALE

TRADE NAME	Scott, Musicale
MANUFACTURER	Scott Radio Labs,, Inc., 4450 Ravenswood Ave., Chicago, Ill.
TYPE SET	AC Operated Record Player Amplifier
TUBES (FOURTEEN)	Types, 6SG7 Mic. Amp., 6B8 Music Cont. Amp., 6SG7 Treble Gate or 6SJ7 Treble Gate, 6SG7 Treble Gate, 6SJ7 Bass Gate, 6SJ7 1st AF Amp., 6SL7GT 2nd AF Amp., 6J5 Audio Coupling, 6J5GT 3rd AF Amp., 6SN7 Phase Inv., (2) 6L6G Power Output (2) 5Y3GT Rectifier.
POWER SUPPLY	110-125 Volts AC
RATING	1.42 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. **Indianapolis Indiana**

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 8/48-#4814-20 SET #44-FOLDER #20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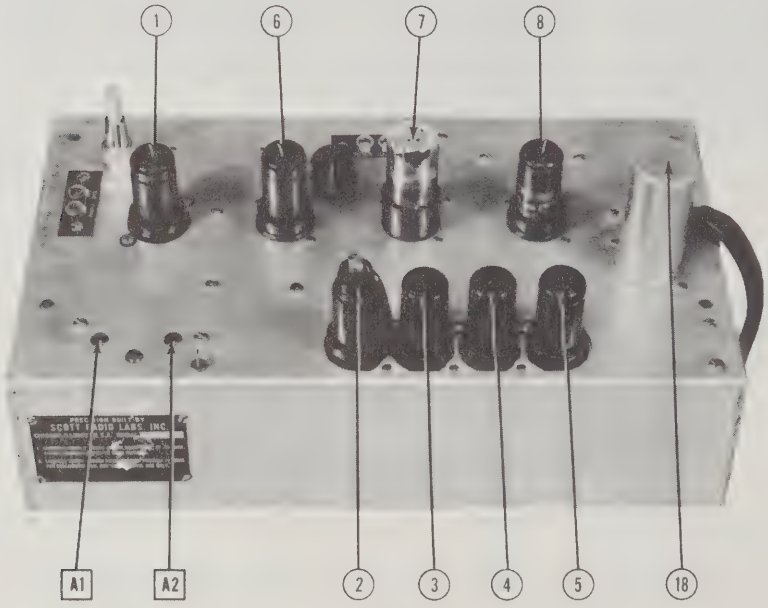
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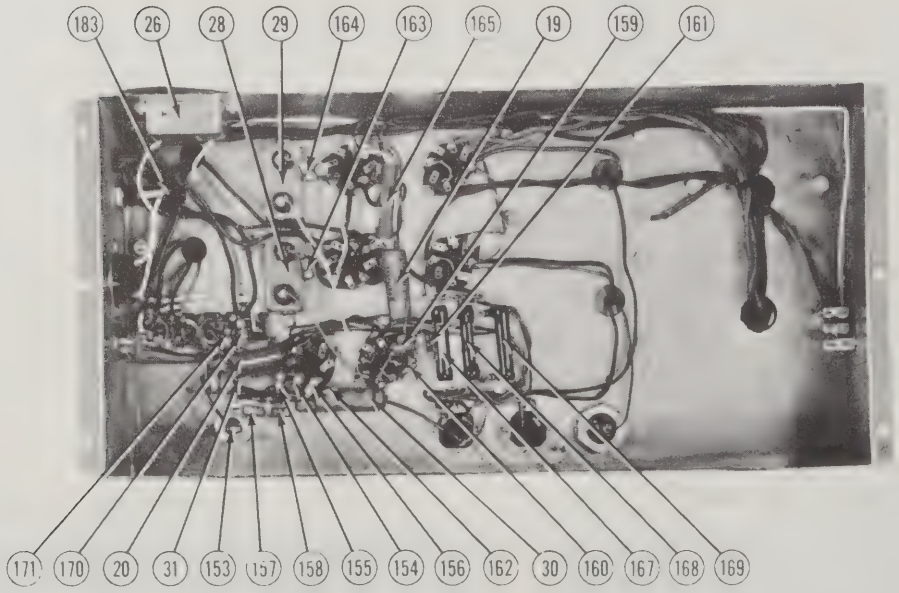
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SCOTT MODEL
MUSICALE
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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SCOTT PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Mic. Amp.	6SG7	6SG7	8BK	
2	Music Cont.Amp.	6B8	6B8	8E	
3	Treble Gate	6SG7	6SG7	8BK	
4A	Treble Gate	6SJ7	6SJ7	8N	
B	" "	6SG7	6SG7	8BK	
5	Bass Gate	6SJ7	6SJ7	8N	
6	1st AF Amp.	6SJ7	6SJ7	8N	
7	2nd AF Amp.	6SL7GT	6SL7GT	8BD	
8	Audio Coupling	6J5	6J5	6Q	
9	3rd AF Amp.	6J5GT	6J5GT	6Q	
10	Phase Inv.	6SN7	6SN7	8BD	
11	Power Output	6L6G	6L6G	7AC	
12	Power Output	6L6G	6L6G	7AC	
13	Rectifier	5Y3GT	5Y3GT	5T	
14	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SCOTT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
15	4	600	15B481	GL-600-4	KR-604	D-4-600	AP-46	Filter
16A	30	450	15A17	AF88J	UP3345	DY-2x30-450	EL-240	"
B	30	450						"
17A	30	450	15K3010	AF88J	UP3345	DY-2x30-450	EL-240	"
B	30	450						"
C	30	450		PR8450-30	BR3045	M-30-450	UT-30	"
18A	20	450	15K3014	AF444J	UP222245*	DY-3x20-450	EL-420*	Decoupling
B	20	450						"
C	20	450						"
19	25	50	15B638	PRS-50-25	BR255	M-25-50	TA-525	Cathode Bypass
20	25	25	15B795	PRS-25-25	BR252A	M-25-25	TA-25	" "
21	25	25	15B795	PRS-25-25	BR252A	M-25-25	TA-25	" "
22	25	25	15B795	PRS-25-25	BR252A	M-25-25	TA-25	" "
23	25	25	15B795	PRS-25-25	BR252A	M-25-25	TA-25	" "
24	25	25	15B795	PRS-25-25	BR252A	M-25-25	TA-25	" "
25	25	25	15B795	PRS-25-25	BR252A	M-25-25	TA-25	" "
26A	.05	600	15A11	630-.05-.05	DYR6005S	XDMR6-2x.05	BP-2056	Line Filter
B	.05	600						" "
27	2	50						Audio Coupling
28	.25	600	15A14	630-.25	DYR6025	XDMR6-.25	BP-256	" "
29	.25	600	15A14	630-.25	DYR6025	XDMR6-.25	BP-256	" "
30	.05	600	15E1041	684-.05	DT6S5	ST-6-05	TC-15	" "
31	.05	600	15E1041	684-.05	DT6S5	ST-6-05	TC-15	" "
32	.05	600	15E1041	684-.05	DT6S5	ST-6-05	TC-15	" "
33	.05	600	15E1041	684-.05	DT6S5	ST-6-05	TC-15	" "
34	.05	600	15E1041	684-.05	DT6S5	ST-6-05	TC-15	Tone Compensation
35	.05	600	15E1041	684-.05	DT6S5	ST-6-05	TC-15	" "
36	.5	600	15B636	630-.5	DYR6050	XDMR6-.5	BP-506	" "
37	.02	600	15E1001	684-.02	DT6S2	ST-6-02	TC-12	Audio Coupling
38	.5	600	15B636	630-.5	DYR6050	XDMR6-.5	BP-506	1st AF Screen Bypass
39	.25	600	15D2915	684-.25	DT6P25	ST-6-25	TC-2	Mic. Amp. Decoupling
40	.1	600	15H2706	684-.1	DT6P1	ST-6-1	TC-1	Mic. Amp. Screen Bypass
41	.01	600	15D3107	684-.01	DT6S1	ST-6-01	TC-11	Audio Coupling
42A	.05	600	15A11	630-.05-.05	DYR6005	XDMR6-2x.05	BP-2056	Screen Bypass
B	.05	600						" "
43A	.25	600	15D3169	630-.25-.25	DYR6022	XDMR6-2x.25	BP-2256	Decoupling
B	.25	600						"
44	.002	600	15H2602	684-.002	DT6D2	ST-6-002	TC-22	Audio Coupling
45A	.05	600	15A11	684-.05	DT6S5	ST-6-05	TC-15	Bass Diode Filter
B	.05	600		684-.05	DT6S5	ST-6-05	TC-15	" " "
46	.005	600	15H2603	684-.005	DT6D5	ST-6-005	TC-25	Treble Diode Filter
47	.006	600	15H2603	684-.005	DT6D5	ST-6-005	TC-25	Treble Diode Filter
48	.05	600	15E1041	684-.05	DT6S5	ST-6-05	TC-15	Audio Coupling
49	.0015	600	15H2704	1467-.0015	1R5D15	MW.5-215	1FM-215	" "
50	.001	600	15H2605	684-.001	DT6D1	ST-6-01	TC-21	Phono Coupling
51	.001	600	15H2605	684-.001	DT6D1	ST-6-01	TC-21	Tone Compensation

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SCOTT PART No.	IRC PART No.	IDENTIFICATION CODES
95	220KΩ	½	70A59	BTS-220K	Red-Red-Yl. Bass Diode Coupling
96	2400Ω	½	70A49	BTS-2200	Red-Yl.-Red Noise Suppressor Cathode
97	240KΩ	½	70D3084	BTS-220K	Red-Yl.-Yl. Tone Compensation
98	470KΩ	½	70A61	BTS-470K	Yl.-Vi.-Yl. " "
99	1 Meg.	½	70A63	BTS-1 Meg.	Br.-Blk.-Grn. " "
100	2.2 Meg.	½	70A64	BTS-2.2 Meg.	Red-Red-Grn. " "
101	220KΩ	½	70A59	BTS-220K	Red-Red-Yl. " "
102	470KΩ	½	70A61	BTS-470K	Yl.-Vi.-Yl. " "
103	330KΩ	½	70H2615	BTS-330K	Or.-Or.-Yl. Audio Voltage Divider
104	220KΩ	½	70A59	BTS-220K	Red-Red-Yl. " " "
105	220KΩ	½	70A59	BTS-220K	Red-Red-Yl. " " "
106	100KΩ	½	70A58	BTS-100K	Br.-Blk.-Yl. " " "
107	100KΩ	½	70A58	BTS-100K	Br.-Blk.-Yl. Tone Compensation
108	100KΩ	½	70A58	BTS-100K	Br.-Blk.-Yl. Treble Gate Grid
109	100KΩ	1	70A65	BTA-100K	Br.-Blk.-Yl. Treble Gate Screen Dropping
110	220KΩ	½	70A59	BTS-220K	Red-Red-Yl. Treble Gate Plate Load
111	22KΩ	½	70H2708	BTS-22K	Red-Red-Or. Bleeder
112	100KΩ	½	70A58	BTS-100K	Br.-Blk.-Yl. Treble Gate Grid
113	100KΩ	1	70A65	BTA-100K	Br.-Blk.-Yl. Treble Gate Screen Dropping
114	220KΩ	½	70A59	BTS-220K	Red-Red-Yl. Treble Gate Plate Load
115	22KΩ	½	70H2708	BTS-22K	Red-Red-Or. Bleeder
116	5.6 Meg.	½	70D3106	BTS-5.6 Meg.	Grn.-Blue-Grn. Phase Shifter
117	1 Meg.	½	70A63	BTS-1 Meg.	Br.-Blk.-Grn. " "
118	330KΩ	½	70H2615	BTS-330K	Or.-Or.-Yl. Bass Gate Grid
119	100KΩ	1	70A65	BTA-100K	Br.-Blk.-Yl. Bass Gate Screen Dropping
120	220KΩ	½	70A59	BTS-220K	Red-Red-Yl. Bass Gate Plate Load
121	10KΩ	½	70A419	BTS-10K	Br.-Blk.-Or. Bleeder
122	1 Meg.	½	70A63	BTS-1 Meg.	Br.-Blk.-Grn. Mic. Amp. Grid
123	2200Ω	½	70K3023	BTS-2200	Red-Red-Red Mic. Amp. Cathode
124	2.2 Meg.	½	70A64	BTS-2.2 Meg.	Red-Red-Grn. Mic. Amp. Screen Dropping
125	470KΩ	½	70A61	BTS-470K	Yl.-Vi.-Yl. Mic.Amp. Plate Load
126	100KΩ	½	70A58	BTS-100K	Br.-Blk.-Yl. Mic. Amp. Decoupling
127	2.2 Meg.	½	70A64	BTS-2.2 Meg.	Red-Red-Grn. Recorder Coupling
128	3000Ω	10	70B681	AB-3000	Decoupling
129	5100Ω	½	70D2878	BTS-4700	Grn.-Br.-Red "
130	560Ω	½	70A46	BTS-560	Grn.-Blue-Br. 1st AF Cathode
131	330KΩ	½	70H2615	BTS-330K	Or.-Or.-Yl. 1st AF Screen Dropping
132	47KΩ	½	70A54	BTS-47K	Yl.-Vi.-Or. 1st AF Plate Load
133	47KΩ	½	70A54	BTS-47K	Yl.-Vi.-Or. 1st AF Plate Load
134	47KΩ	½	70A54	BTS-47K	Yl.-Vi.-Or. 1st AF Decoupling
135	160KΩ	½		BTS-150K	Br.-Blue-Yl. Bleeder-See Note 2
136	100KΩ	½	70A58	BTS-100K	Br.-Blk.-Yl. Tone Compensation
137	470KΩ	½	70A61	BTS-470K	Yl.-Vi.-Yl. 2nd AF Grid
138	2400Ω	½	70A49	BTS-2200	Red-Yl.-Red 2nd AF Cathode
139	10KΩ	½	70A419	BTS-10K	Br.-Blk.-Or. " " "
140	100KΩ	½	70A58	BTS-100K	Br.-Blk.-Yl. 2nd AF Plate Load
141	220KΩ	½	70A59	BTS-220K	Red-Red-Yl. Tone Compensation
142	47KΩ	½	70A54	BTS-47K	Yl.-Vi.-Or. " "
143	240KΩ	½	70D3084	BTS-220K	Red-Yl.-Yl. Bass Amp. Plate
144	240KΩ	½	70D3084	BTS-220K	Red-Yl.-Yl. Tone Compensation
145	120KΩ	½	70E1213	BTS-120K	Br.-Red-Yl. " "
146	100KΩ	½	70A58	BTS-100K	Br.-Blk.-Yl. " "
147	2400Ω	½	70A49	BTS-2200	Red-Yl.-Red Bass Amp. Cathode
148	47KΩ	½	70A54	BTS-47K	Yl.-Vi.-Or. Bass Amp. Plate Load
149	120KΩ	½	70E1213	BTS-120K	Br.-Red-Yl. Bass Amp. Grid-See Note 3
150	100KΩ	½	70A58	BTS-100K	Br.-Blk.-Yl. Tone Compensation
151	100KΩ	½	70A58	BTS-100K	Br.-Blk.-Yl. Audio Coupling Amp. Grid
152	220KΩ	½	70A59	BTS-220K	Red-Red-Yl. Tone Compensation
153	10KΩ	½	70A419	BTS-10K	Br.-Blk.-Or. Audio Coupling Amp. Cathode
154	220KΩ	½	70A59	BTS-220K	Red-Red-Yl. 3rd AF Grid
155	2400Ω	½	70A49	BTS-2200	Red-Yl.-Red 3rd AF Cathode
156	47KΩ	½	70A54	BTS-47K	Yl.-Vi.-Or. 3rd AF Plate Load
157	560Ω	½	70A46	BTS-560	Grn.-Blue-Br. Feedback
158	56Ω	½	70A43	BW-½-56	Grn.-Blue-Blk "
159	220KΩ	½	70A59	BTS-220K	Red-Red-Yl. Phase Inverter Grid
160	680Ω	½	70E1077	BTS-680	Blue-Gray-Br. Phase Inverter Cathode
161	6800Ω	½	70D2770	BTS-6800	Blue-Gray-Red " " "
162	7500Ω	½	70E1074		Vi.-Grn.-Red Phase Inverter Plate Load
163	47KΩ	½	70A54	BTS-47K	Yl.-Vi.-Or. Output Grid
164	47KΩ	½	70A54	BTS-47K	Yl.-Vi.-Or. " "
165	210Ω	10	70D2769	AB-200	Output Cathode
166	750Ω	20	70B990	DG-750	Filter
167	30KΩ	10	70D3108	AB-30K	Bleeder

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SCOTT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
52	.005	600	15H2603	684-.005	DT6D5	ST-6-005	TC-25	Tone Compensation
53	.005	600	15H2603	684-.005	DT6D5	ST-6-005	TC-25	" "
54	.01	600	15H2606	684-.01	DT6S1	ST-6-01	TC-11	" "
55	.01	600	15H2606	684-.01	DT6S1	ST-6-01	TC-11	" "
56	.002	600	15H2602	684-.002	DT6D2	ST-6-002	TC-22	" "
57	.0025	600	15E1855	1467-.0025	1R5D25	MW.5-225		Audio Coupling
58	.005	600	15H2603	684-.005	DT6D5	ST-6-05	TC-15	" "
59	.0005	600	15H2705	1467-.0005	DT6T5	ST-6-0005	TC-35	Phase Shifting Cap.
60	.005	600	15H2603	684-.005	DT6D5	ST-6-005	TC-25	DC Blocking
61	.002	600	15H2602	684-.002	DT6D2	ST-6-002	TC-22	Phase Shifting Cap.
62	.005	600	15H2603	684-.005	DT6D5	ST-6-005	TC-25	DC Blocking
63	.001	600	15H2605	684-.001	DT6D1	ST-6-001	TC-21	Audio Coupling
64	.001	600	15H2605	684-.001	DT6D1	ST-6-001	TC-21	" "
65	.0035	600	15E1897					Tone Compensation
66	.002	600	15H2602	684-.002	DT6D2	ST-6-002	TC-22	" "
67	.001	600	15H2605	684-.001	DT6D1	ST-6-001	TC-21	" "
68	.0005	600	15H2705	1467-.0005	DT6T5	ST-6-0005	TC-35	" "
69	.005	600	15H2603	684-.005	DT6D5	ST-6-005	TC-25	Audio Coupling
70	25	500	15E1849	1468-.000025	5W5Q25	MO.5-425	MB-425	Recorder Coupling
71	240	500	15A31	1468-.00025	5W5T25	MO.5-325	1FM-325	Phase Shifting Cap.
72	100	500	15A29	1468-.0001	5W5T1	MO.5-31	1FM-31	" " "
73	100	500	15A29	1468-.0001	5W5T1	MO.5-31	1FM-31	Fixed Trimmer
74	240	500	15A31	1468-.00025	5W5T25	MO.5-325	1FM-321	Bass Diode Bypass
75	240	500	15A31	1468-.00025	5W5T25	MO.5-325	1FM-321	Tone Compensation
76	125	500	15K3192	1468-.0001	5W5T1	MO.5-31	1FM-31	" " -Note
77	100	500	15A29	1468-.0001	5W5T1	MO.5-31	1FM-31	" "
184	.02	600	15E1001	684-02	DT6S2	ST-6-02	TC-12	" "

Note-Not used in models with serial number less than #20.
*Omit one section.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SCOTT PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
78A	1 Meg.	½	70K3020	D13-137	M-63-Z	Volume Control
B	Shaft		Not Req.	A	Not Req.	Attach to 78A per instructions
79A	250KΩ	½	70K3021	D13-130X	T-42	Treble Control tapped @ 125KΩ
B	Shaft		Not Req.	A	Not Req.	Attach to 79A per instructions
80A	500KΩ	½	70K3022	D13-133	M-60-Z	Bass Control
B	Shaft		Not Req.	A	Not Req.	Attach to 80A per instructions
C	Switch		" "	41	SW-A	" " " " "
81A	1 Meg.	½	70E1718	D13-137	M-63-Z	Bass Limit Control
B	Shaft		Not Req.	A	Not Req.	Attach to 81A per instructions
82A	1 Meg.	½	70H2613	D13-137	M-63-Z	Input Volume Level Control
B	Shaft		Not Req.	A	Not Req.	Attach to 82A per instructions

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SCOTT PART No.	IRC PART No.	IDENTIFICATION CODES
83	330KΩ	½	70H2615	BTS-330K	Or.-Or.-Yl. Tone Compensation
84	20 Meg.	½	70H2709	BTS-22 Meg.	Red-Blk.-Blue Treble Diode Load
85	470KΩ	½	70A61	BTS-470K	Yl.-Vi.-Yl. Treble Diode Filter
86	1 Meg.	½	70A63	BTS-1 Meg.	Br.-Blk.-Grn. Treble Diode Filter
87	100Ω	½	70E1196	BW-½-100	Br.-Blk.-Br. Music Amp. Cathode
88	160KΩ	½	70D2879	BTS-150K	Br.-Blue-Yl. Music Amp. Plate Load
89	47KΩ	½	70A54	BTS-47K	Yl.-Vi.-Or. Music Amp. Plate Load
90	560KΩ	½	70A62	BTS-560K	Grn.-Blue-Yl. Music Amp. Screen Dropping
91	75KΩ	½	70A56	BTS-82K	Vi.-Grn.-Or. Bleeder-See Note 1
92	1.5 Meg.	½	70B846	BTS-1.5 Meg.	Br.-Grn.-Grn. Bass Diode Load
93	1 Meg.	½	70A63	BTS-1 Meg.	Br.-Blk.-Grn. Bass Diode Filter
94	1 Meg.	½	70A63	BTS-1 Meg.	Br.-Blk.-Grn. Bass Diode Filter

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SCOTT PART No.	IRC PART No.	IDENTIFICATION CODES
168	2000Ω	10	70K3136	AB-2000	Filter
169	300Ω	10	70B682	AB-300	"
170	270Ω		70E1197	BW-½-270	Red-Vi.-Br. Hum Balance
171	270Ω		70E1197	BW-½-270	Red-Vi.-Br. " "
172	470KΩ	½	70A61	BTS-470K	Yl.-Vi.-Yl. Phono Shunt

Note 1-Sets with serial number less than #80 use 120KΩ in this application.
Note 2-Not used after serial #80.
Note 3-Not used in sets with serial #1 & #2.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA SCOTT PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
173	117V AC @ 1.42A	820V CT .15A DC	5.3V AC @ 4.0A	6.6V AC @ 3.0A SEC. 4 7.0V AC @ 3.0A	91K3043		T22R35# and T21F10#	P-3155 and P-2947#

#Drill new mounting holes.

FILTER CHOKE

ITEM NO.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∩)	REPLACEMENT DATA SCOTT PART NO.	STANCOR PART NO.	THORDARSON PART NO.	MERIT PART No.	INSTALLATION NOTES
174	.045A.	70Ω	5.5 Henries	17B492	C-2309#	T20C54#	C-3195#	#Drill new mounting hole.
175	.105A.	70Ω	5.5 Henries	17B492	C-1709#	T20C53#	C-3196#	

FILTER (TONE)

ITEM NO.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∩)	REPLACEMENT DATA SCOTT PART NO.	STANCOR PART NO.	THORDARSON PART NO.	MERIT PART No.	INSTALLATION NOTES
176A		275Ω	1.3 Henries	17H2701				
B		80Ω	.4 Henries					
177		235Ω	11 Henries	17B591				

TRANSFORMER (OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA SCOTT PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	INSTALLATION NOTES
178	5600Ω CT	16Ω tapped @ 8Ω	150Ω CT	.7Ω tapped @ .4Ω	91C2699	A-3800#	T22870#	A-3131#	#Drill new mounting holes.

SPEAKER

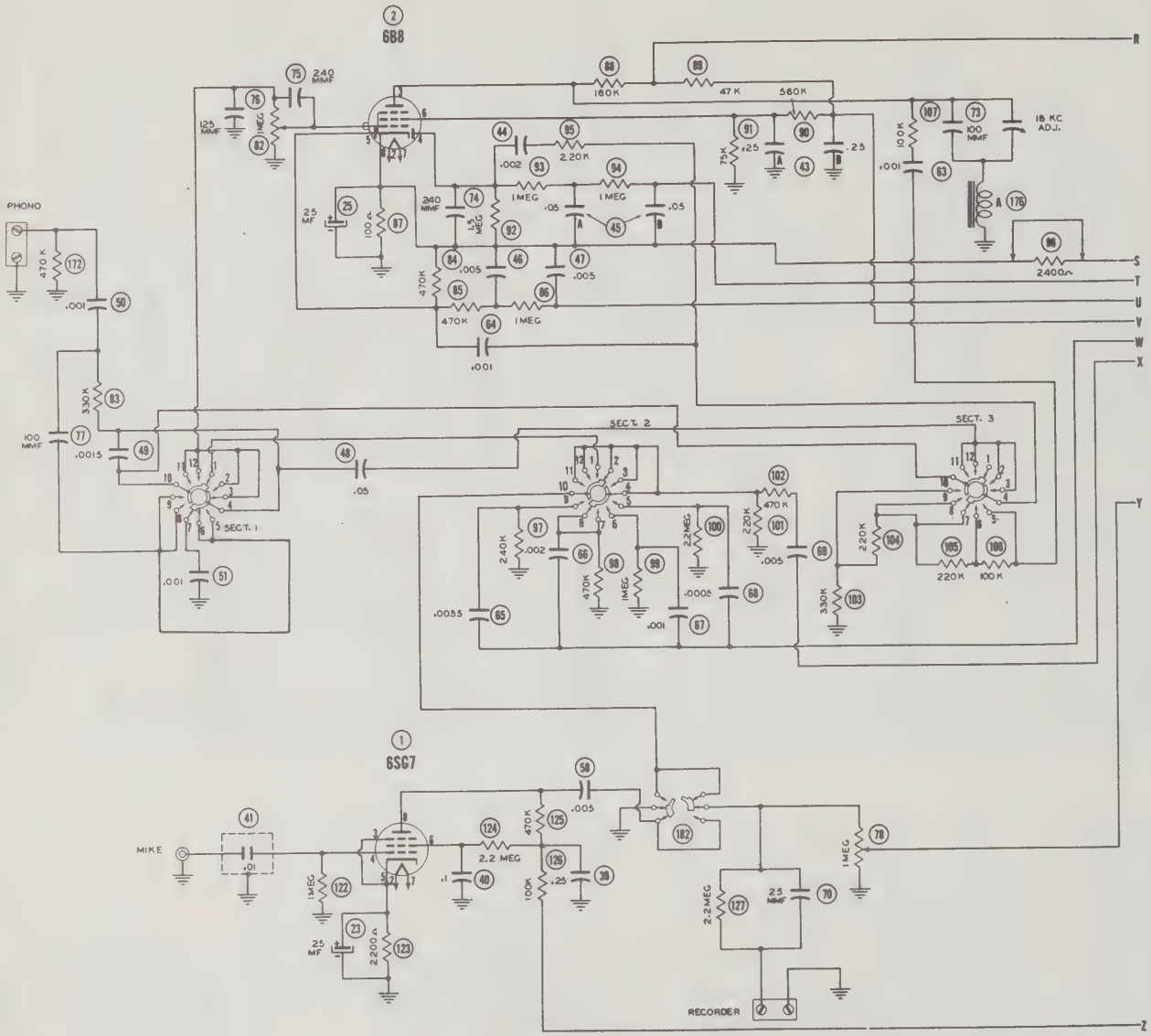
ITEM No.	RATINGS		REPLACEMENT DATA SCOTT PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD RES.	VC IMP.				
179A	PM	16Ω	85B2688	ST-122‡		‡Add 16Ω to 500Ω transformer to
B	HIGH FREQUENCY HORN		INSIDE OF ITEM #80.	Mod. HNP-51		match output of receiver.
	CONE DIA.	VC DIA.				
180	14¼"	2-1/8"				

MISCELLANEOUS

ITEM No.	PART NAME	SCOTT PART No.	NOTES
181	Switch	89K3025-1	Tone
182	"	89K3039	Phono-Mike
183	Fuse	37A162	3 Amp. (3AG)

SCOTT MODEL PAGE 5
MUSICALE

DATE 8/48-#8814-20 SET #44-FOLDER #20



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	6SG7	0V.	3.5VAC	1.1VDC	0V.	1.1VDC	20VDC	3.5VAC	82VDC	-
2	6B8	0V.	3.5VAC	127VDC	0V.	0V.	19VDC	3.5VAC	1VDC	0V.
3	6SG7	0V.	3.5VAC	1VDC	0V.	1VDC	42VDC	3.5VAC	22VDC	-
4	6SG7	0V.	3.5VAC	1VDC	0V.	1VDC	42VDC	3.5VAC	100VDC	-
5	6SJ7	0V.	3.5VAC	1VDC	0V.	1VDC	22VDC	3.5VAC	141VDC	-
6	6SL7GT	0V.	3.5VAC	1VDC	0V.	1VDC	45VDC	3.5VAC	60VDC	-
7	6SL7GT	0V.	200VDC	2.3VDC	6VDC	200VDC	10VDC	3.5VAC	3.5VAC	-
8	6J5	0V.	3.5VAC	295VDC	0V.	0V.	0V.	3.5VAC	13.5VDC	-
9	6J5GT	0V.	6.6VAC	165VDC	0V.	0V.	0V.	0V.	7VDC	-
10	6SN7	50VDC	250VDC	67.5VDC	50VDC	250VDC	67.5VDC	6.6VAC	0V.	-
11	6L6G	0V.	0V.	340VDC	310VDC	0V.	0V.	6.6VAC	23VDC	-
12	6L6G	0V.	0V.	340VDC	310VDC	0V.	0V.	6.6VAC	23VDC	-
13	5Y3GT	0V.	430VDC	0V.	410VAC	0V.	410VAC	0V.	430VDC	-
14	5Y3GT	0V.	430VDC	0V.	410VAC	0V.	410VAC	0V.	430VDC	-

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	6SG7	0Ω	.05Ω	2.2KΩ	1 Meg.	2.2KΩ	2.3 Meg.	.05Ω	595KΩ	-
2	6B8	0Ω	.05Ω	225KΩ	1.5 Meg.	20 Meg.	56KΩ	.05Ω	100Ω	1 Meg.
3	6SG7	0Ω	.05Ω	100Ω	20 Meg.	100Ω	20KΩ	.05Ω	245KΩ	-
4	6SG7	0Ω	.05Ω	100Ω	20 Meg.	100Ω	20KΩ	.05Ω	245KΩ	-
5	6SJ7	0Ω	.05Ω	100Ω	3.8 Meg.	100Ω	10KΩ	.05Ω	245KΩ	-
6	6SL7GT	0Ω	.05Ω	560Ω	0Ω	560Ω	400KΩ	.05Ω	170KΩ	-
7	6SL7GT	0Ω	130KΩ	2.4KΩ	50KΩ	130KΩ	12.4KΩ	.05Ω	.05Ω	-
8	6J5	0Ω	.05Ω	25KΩ	0Ω	100KΩ	0Ω	.05Ω	10KΩ	-
9	6J5	0Ω	.1Ω	52KΩ	INF.	220KΩ	INF.	0Ω	2.4KΩ	-
10	6SN7	220KΩ	28KΩ	7.5KΩ	220KΩ	28KΩ	7.5KΩ	.1Ω	0Ω	-
11	6L6G	0Ω	0Ω	20KΩ	22KΩ	47KΩ	INF.	.1Ω	210Ω	-
12	6L6G	0Ω	0Ω	20KΩ	22KΩ	47KΩ	INF.	.1Ω	210Ω	-
13	5Y3GT	0Ω	20KΩ	INF.	80Ω	INF.	80Ω	INF.	20KΩ	-
14	5Y3GT	0Ω	20KΩ	INF.	78Ω	INF.	75Ω	INF.	20KΩ	-

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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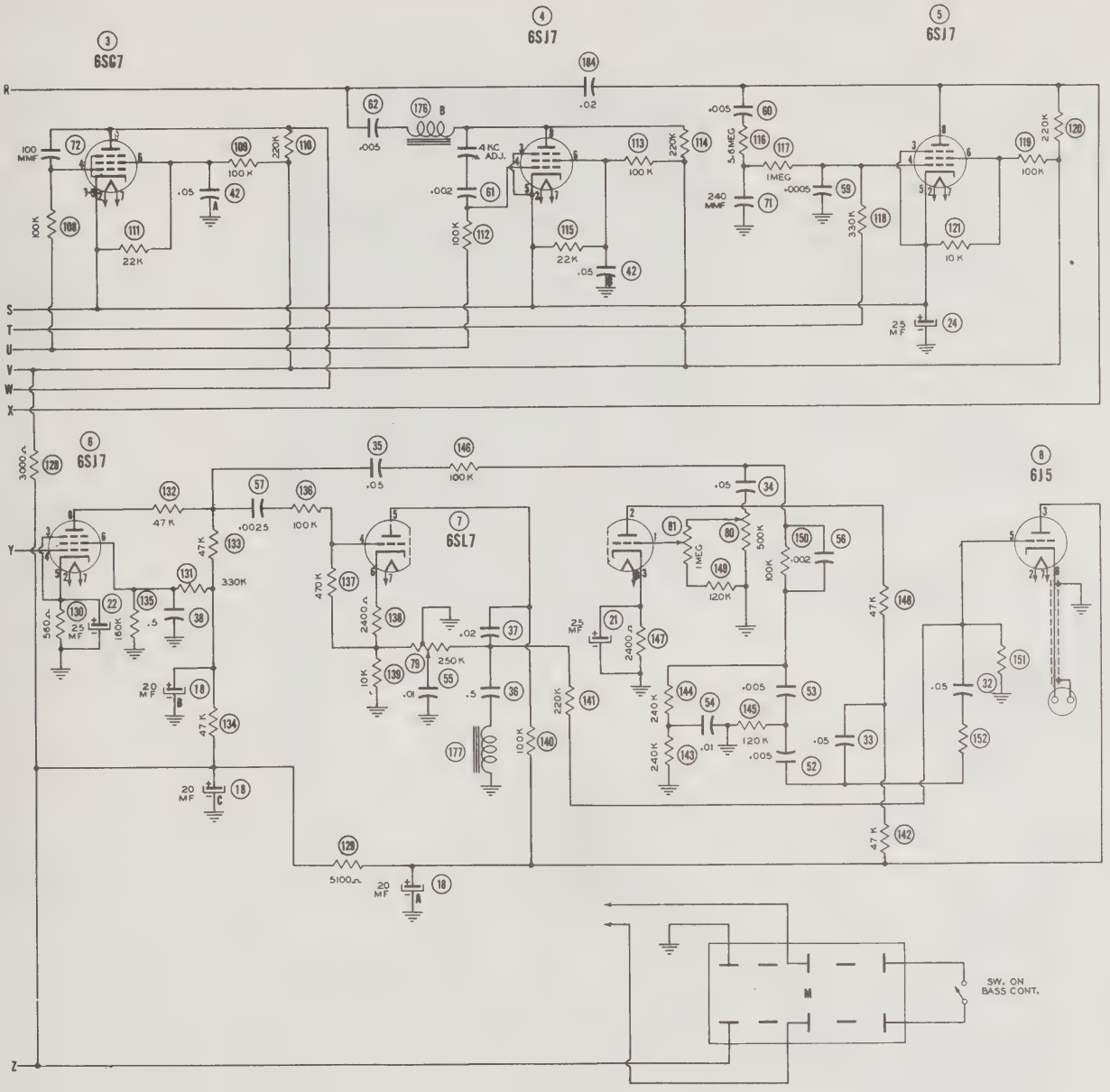

STAGE GAIN MEASUREMENTS		
MIC. AMP.	100X	400 ∿
6B8	100X	400 ∿
1st AUDIO	100X	400 ∿
2nd AUDIO	2X	400 ∿
3rd AUDIO	40X	400 ∿
CATHODE FOLLOWER	.9X	400 ∿

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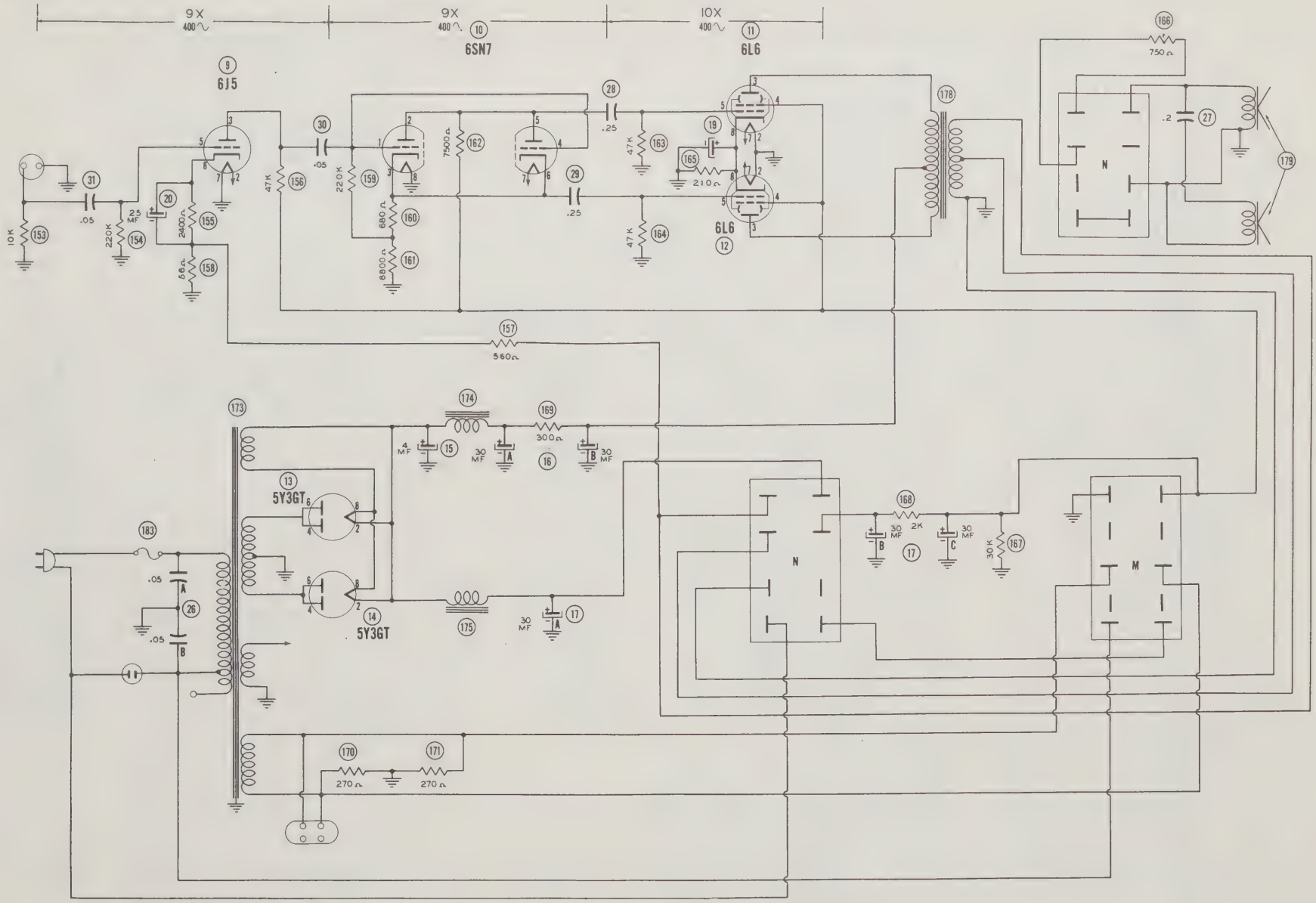
4814-20

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of + 15% in voltage and resistance readings.
6 - All controls at minimum, no signal applied for voltage measurements.



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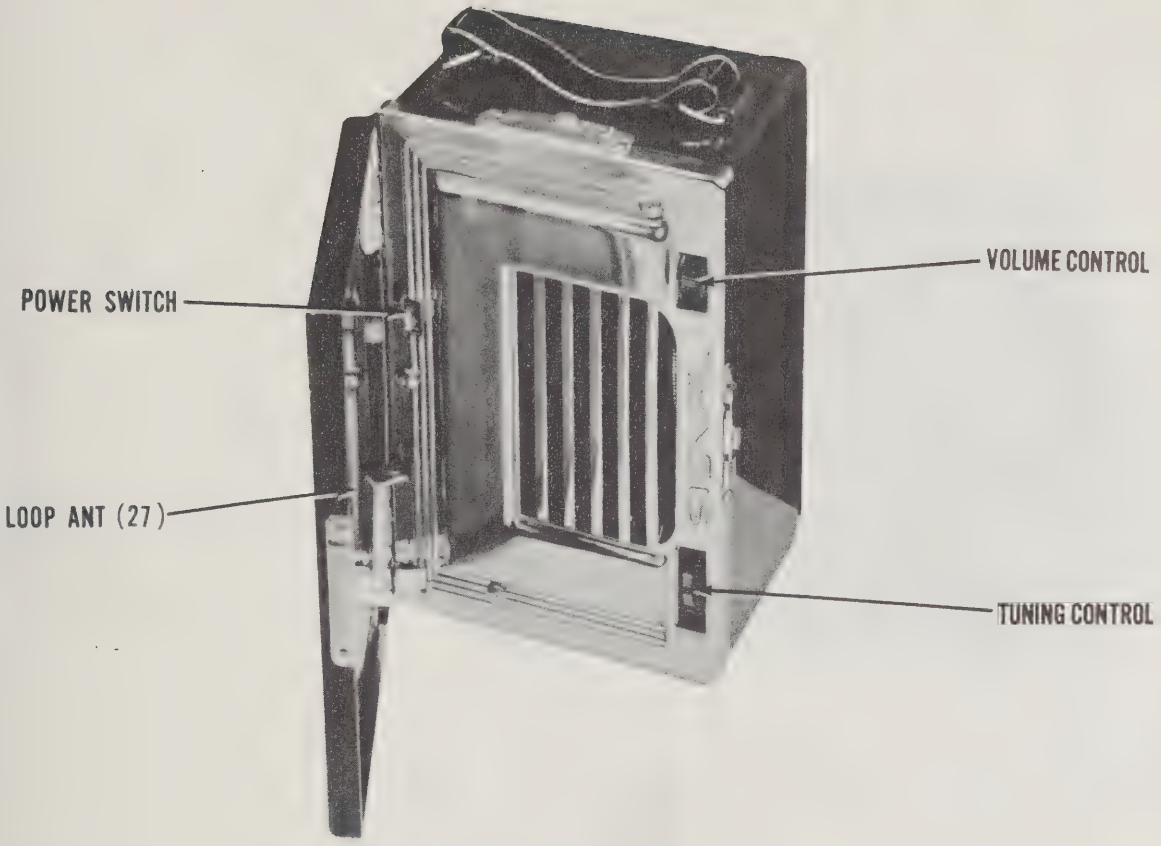
SIGNAL MODEL 141
BATTERY OPERATED



SIGNAL MODEL 141
BATTERY OPERATED

SIGNAL MODEL 141

TRADE NAME	Signal, Model 141
MANUFACTURER	Signal Electronics Inc., 114 E. 16th St., New York, N.Y.
TYPE SET	Battery Operated Portable Superheterodyne Receiver with Loop Antenna
TUBES (FOUR)	Types, 1R5 Converter, 1T4 IF Amp., 1S5 Det.-AVC-AF, 3S4 Power Output
POWER SUPPLY	1.5 Volt "A" Supply and 45 Volt "B" Supply
RATING	240MA @ 1.5 Volts DC and 8.5MA @ 45 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01 MFD	High side to large stator of tuning cap. Low side to chassis.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4	Adjust for maximum output.
2		Loop	1630KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1400KC	Tune for maximum output.	"	A6	Adjust for maximum output.

HOWARD W. SAMS & CO., INC. Indianapolis Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		SIGNAL PART No.	STANDARD REPLACEMENT		
1	Converter	1R5	1R5	7AT	
2	IF Amp.	1T4	1T4	6AR	
3	Det.-AVC-AF	1S5	1S5	6AU	
4	Power Output	3S4	3S4	7BA	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	SIGNAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	
5	8	100		PRS150/8	BR815	LB-10-100	UT-81	Filter
6	.002	150			ZZW1D2	TST-2-002		Output Plate Bypass
7	.002	150			ZZW1D2	TST-2-002		Audio Coupling
8	.01	150			ZYW1S1	TST-2-01		AF Screen Bypass
9	.002	150			ZZW1D2	TST-2-002		Audio Coupling
10	.01	150			ZYW1S1	TST-2-01		AVC Filter
11	100	300		1468-0001	5W5T1	MO.5-31	1FM-31	AF Plate Bypass-Cer.
12	100	300		1468-0001	5W5T1	MO.5-31	1FM-31	Diode RF Filter-Cer.
13	150	300		1468-00015	5W5T15	MO.5-315	1FM-315	RF Bypass-Cer.
14	100	300		1468-0001	5W5T1	MO.5-31	1FM-31	Osc. Grid Cap.-Cer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	SIGNAL PART No.	IRC PART No.	CLAROSTAT PART No.	
15	1 Meg.	½				Volume Control

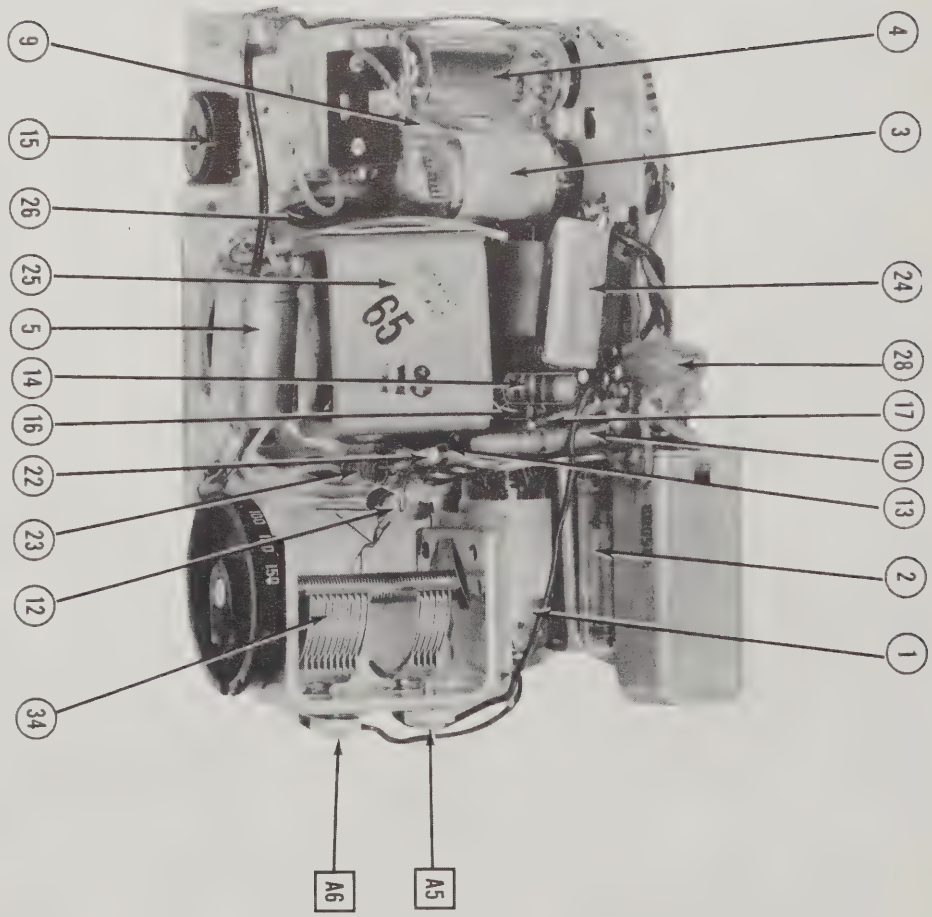
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	SIGNAL PART No.	IRC PART No.	
16	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Oscillator Grid
17	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. AVC Network
18	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue AF Grid
19	3.3 Meg.	½		BTS-3.3 Meg.	Or.-Or.-Grn. AF Screen
20	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. AF Plate
21	3.3 Meg.	½		BTS-3.3 Meg	Or.-Or.-Grn. Output Grid
22	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. Bias Network
23	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. " "

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		SIGNAL PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
24	8300Ω	15Ω	205Ω	1.1Ω	307004-A			A-2998#	#Bend mounting tab down on one side, cut off tab on other side.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: SIGNAL PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
25	FIELD PM	VC IMP. 15Ω	2-AM-4			
26	CONE DIA. 2-3/8"	VC DIA. 1/2"				

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: SIGNAL PART No.	MEISSNER PART No.	
27	Loop Ant.		3.8Ω			
28	Osc. Coil	1.8Ω	7.5Ω			
29	Input IF	24Ω	23.8Ω			
30	Output IF	19.8Ω	19.8Ω			

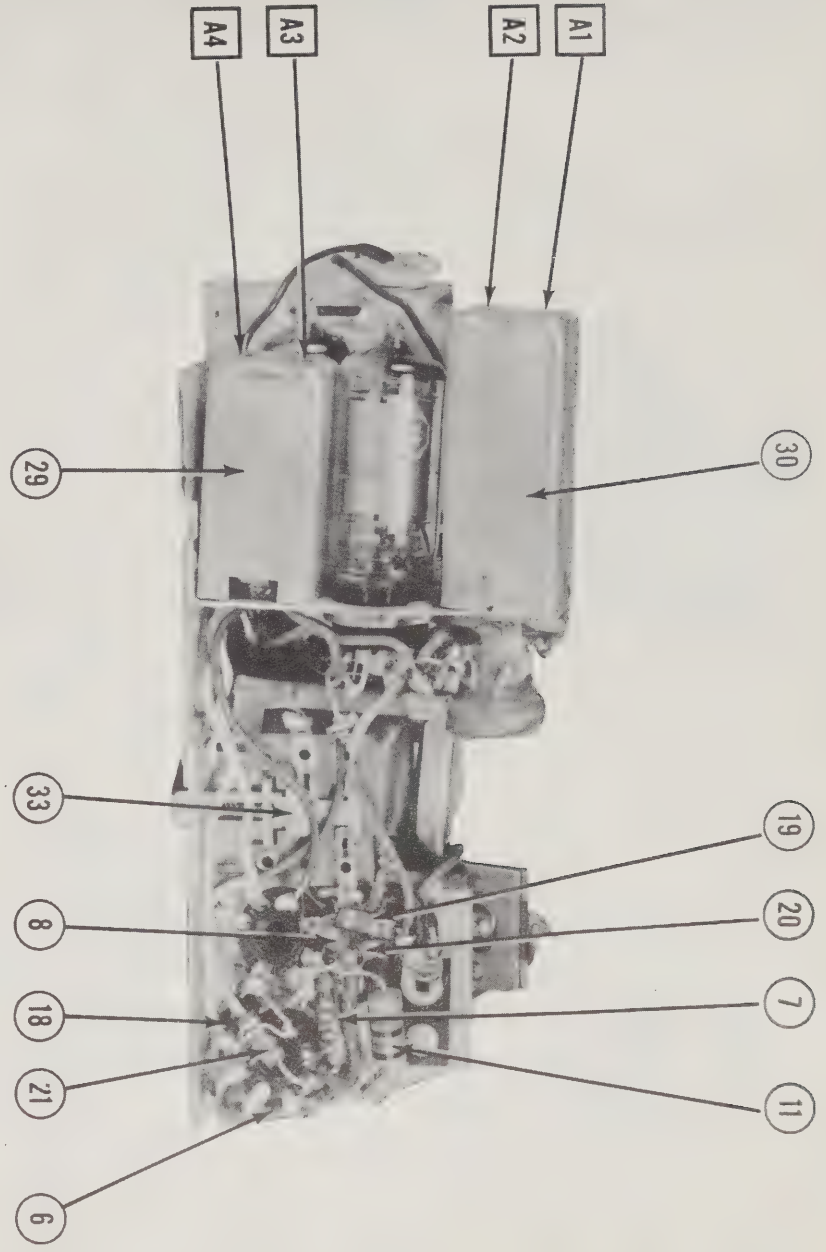
BATTERIES

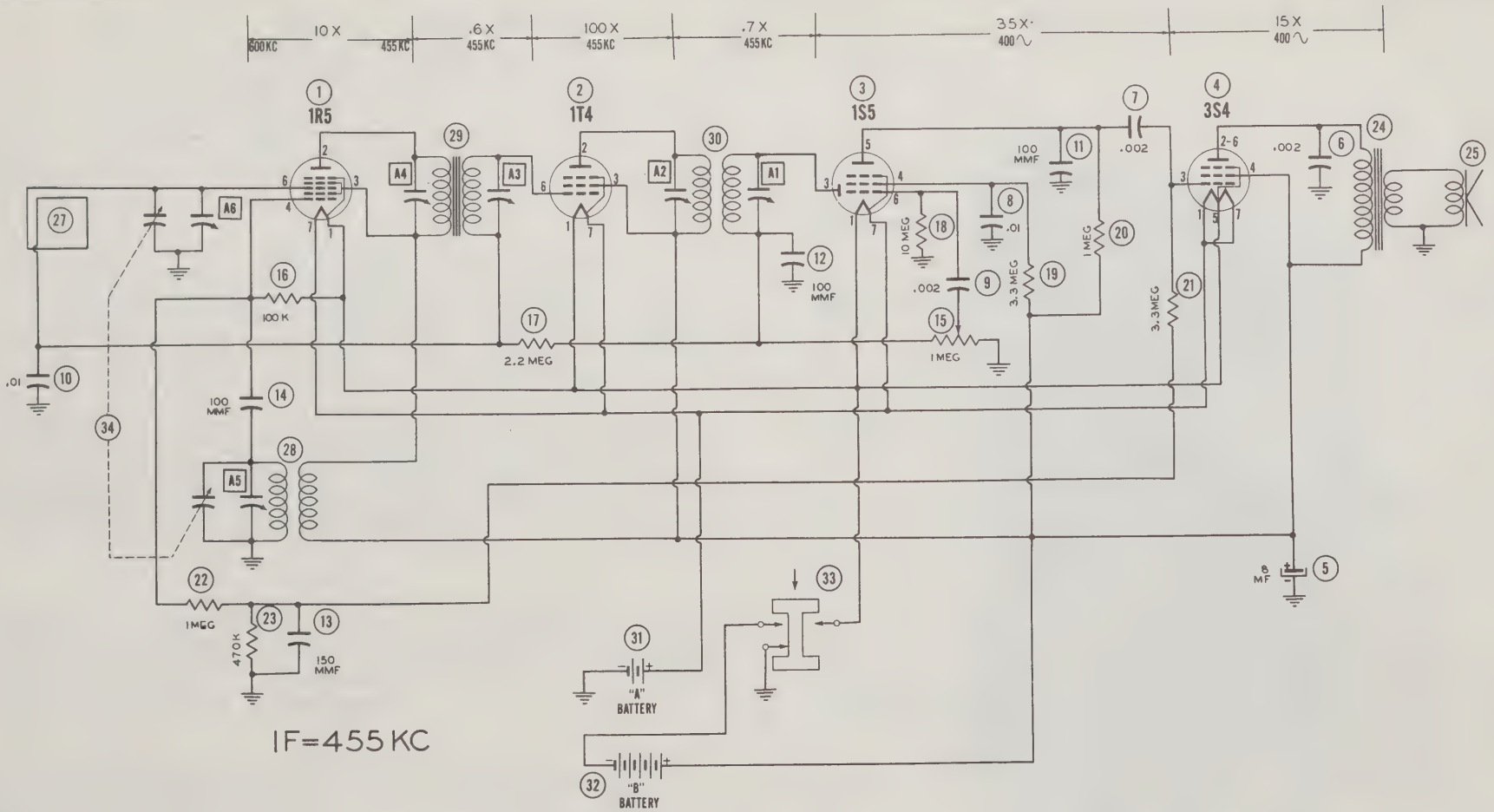
ITEM No.	VOLTAGE	SIGNAL PART No.	REPLACEMENT DATA: EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
31	1.5V "A"		950			2R			
32	45V "B"			455			XX30		

MISCELLANEOUS

ITEM No.	PART NAME	SIGNAL PART No.	NOTES
33	Switch		On-Off
34	2 Gang Var. Cap.		(20-285MMF, 25-140MMF)

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	0V.	45VDC	45VDC	-9.8VDC§	0V.	0V.	1.5VDC
2	1T4	0V.	45VDC	45VDC	0V.	0V.	0V.	1.5VDC
3	1S5	0V.	-.6VDC	0V.	10VDC	9VDC	0V.	1.5VDC
4	3S4	1.5VDC	44VDC	-.2VDC	45VDC	0V.	44VDC	1.5VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	0Ω	10 Meg.	10 Meg.	100KΩ	INF.	3.2 Meg.	*
2	1T4	0Ω	10 Meg.	10 Meg.	3 Meg.	INF.	3.2 Meg.	*
3	1S5	0Ω	320KΩ	1 Meg.	15 Meg.	10 Meg.	10 Meg.	*
4	3S4	*	10 Meg.	4 Meg.	10 Meg.	0Ω	10 Meg.	*

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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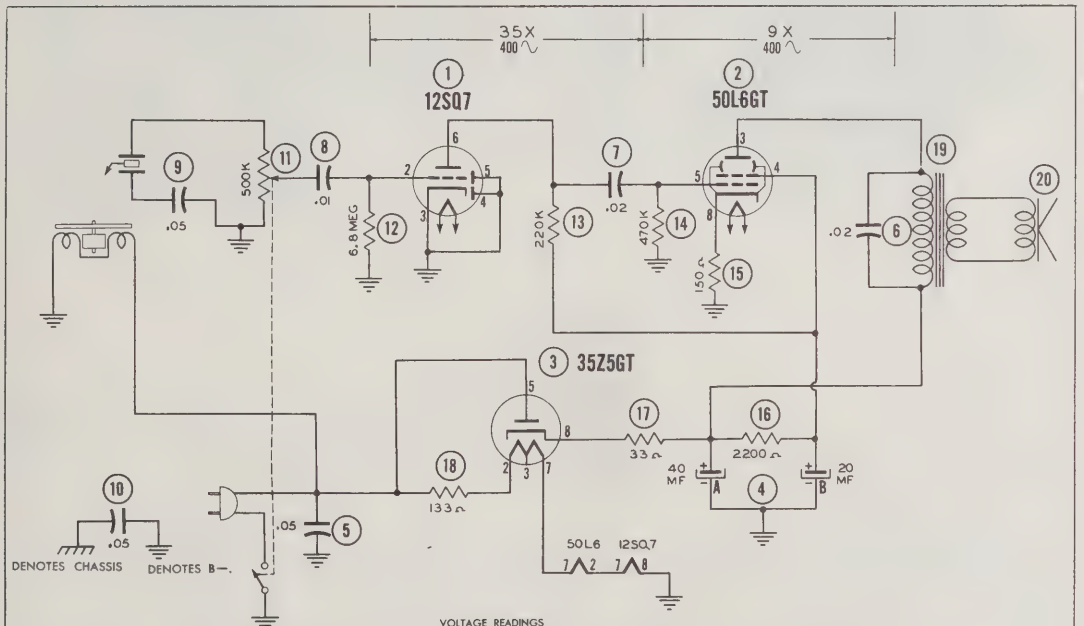
4814-21

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by shorting AVC to chassis.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5 - Volume control at maximum, no signal applied for voltage measurements.

SILVERTONE MODEL 8148

TRADE NAME	Silvertone, Model 8148 (Ch. 109.632)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan St., Chicago, Ill.
TYPE SET	AC Operated Portable Phono Player with 3 Tube Amplifier
TUBES (THREE)	Types, 12SQ7GT AF Amp., 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	105-125 Volts AC RATING .23 Amp. @ 117 Volts AC



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SQ7GT	0V.	-.9VDC	0V.	0V.	0V.	70VDC	12VAC	0V.
2	50L6GT	0V.	12VAC	120VDC	120VDC	0V.	0V.	60VAC	7.2VDC
3	35Z5GT	0V.	65VAC	80VAC	0V.	117VAC	0V.	60VAC	132VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SQ7GT	INF.	6.8 Meg.	0Ω	0Ω	0Ω	420KΩ	13Ω	0Ω
2	50L6GT	INF.	13Ω	150KΩ	150KΩ	470KΩ	INF.	60Ω	15Ω
3	35Z5GT	INF.	100Ω	60Ω	INF.	233Ω	INF.	60Ω	150KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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4814-22

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at minimum, no signal applied for voltage measurements.

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DATE 8/48-#4814-22 SET #44-FOLDER #22

SILVERTONE MODEL
8148 (Ch. 109.632)

SILVERTONE MODEL
8148 (Ch. 109.632)

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	AF Amp.	12SQ7GT	12SQ7GT	8Q	
2	Power Output	50L6GT	50L6GT	7AC	
3	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
4A	40	150	DA8948	AF88D	UP4215	DY-4020-150	EL-24	■ Filter
B	20	150						▲ ■
5	.05	400		484-05	DT4S5	ST-4-05	TC-15	Line Filter
6	.02	400		484-02	DT4S2	ST-4-02	TC-12	Output Plate Bypass
7	.02	400		484-02	DT4S2	ST-4-02	TC-12	Audio Coupling
8	.01	400		484-01	DT4S1	ST-4-01	TC-11	" "
9	.05	400		484-05	DT4S5	ST-4-05	TC-15	Phono Isolation
10	.05	400		484-05	DT4S5	ST-4-05	72P1	Line Isolation

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
11	500KΩ	½	DB55578-3			Volume Control & Sw.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	IDENTIFICATION CODES
12	6.8 Meg.	½		BTS-6.8 Meg.	Blue-Gray-Grn. Audio Grid
13	220KΩ	½		BTS-220K	Red-Red-Yl. Audio Plate Load
14	470KΩ	½		BTS-470K	Yl.-Vl.-Yl. Output Grid
15	150Ω	½		BW-½-150	Br.-Grn.-Br. Output Cathode
16	2200Ω	½		BTS-2200	Red-Red-Red Filter
17	33Ω	½		BW-½-33	Or.-Or.-Blk. Surge Limiter
18	133Ω	5	DA-9528	ABA-150	Line Dropping-See Note

Note-On IRC replacement set slider 133Ω from end.

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	INSTALLATION NOTES
19	2000Ω	3.3Ω	250Ω	.7Ω	DC-51578-3	A-3876	T22S45	A-2928	

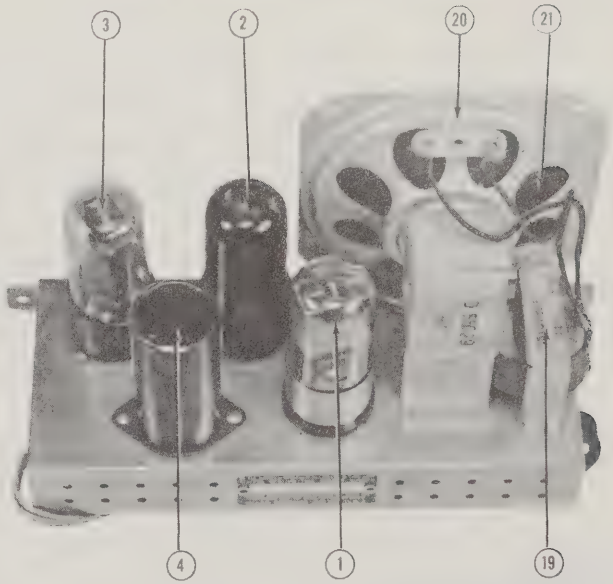
SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: SILVERTONE PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
20	FIELD PM	VC IMP. 3.3Ω	DD-56029	ST-113* Mod. P4-X	4A15*	*Drill new mounting holes.
21	CONE DIA. ½"	VC DIA. 4"				

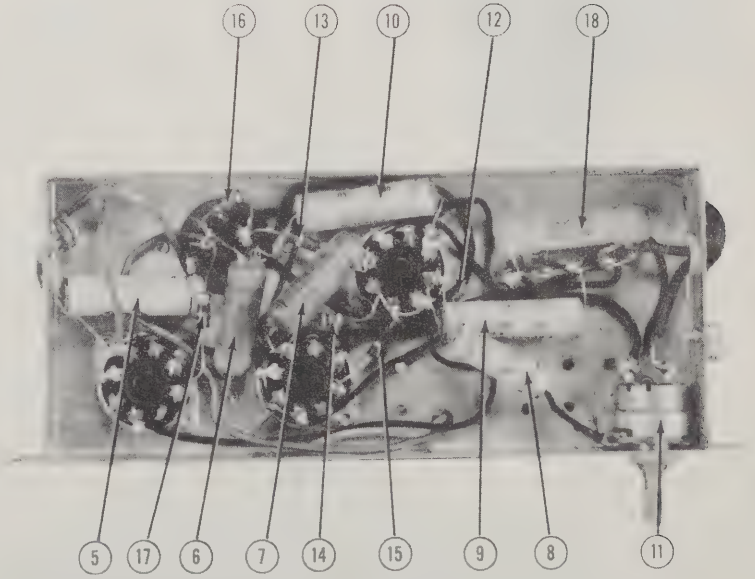
MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
	Knob	DC59614-1	

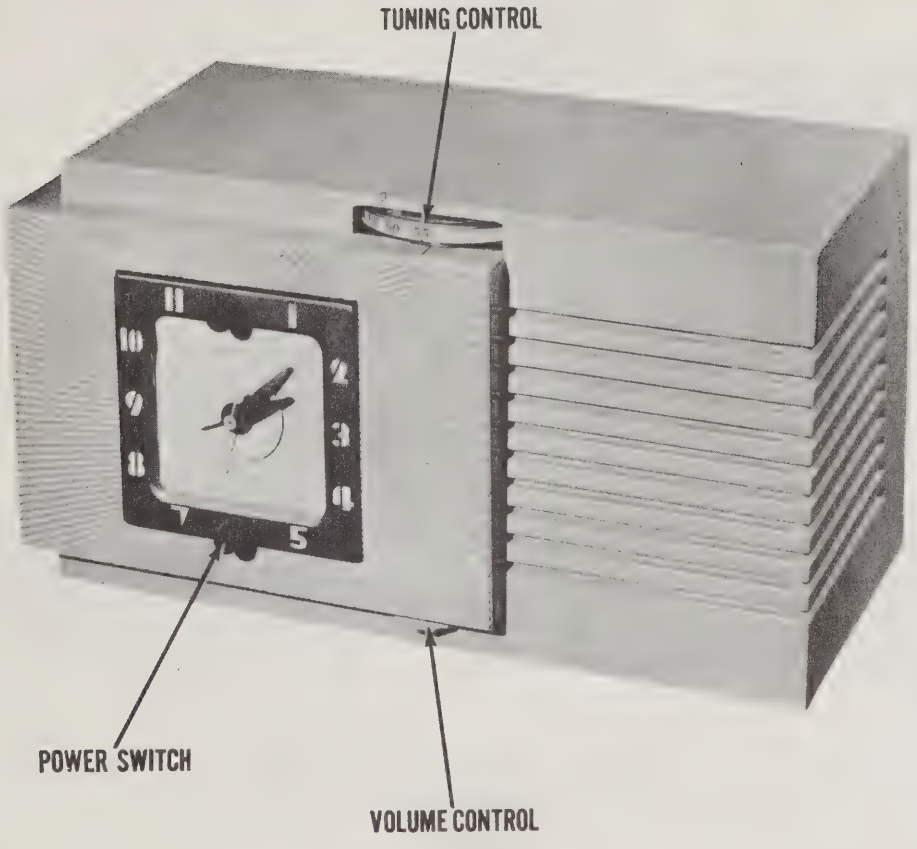
CHASSIS—TOP VIEW



CHASSIS—BOTTOM VIEW



TELECHRON MODEL
8H67 "MUSALARM"



TELECHRON MODEL
8H67 "MUSALARM"

TELECHRON MODEL 8H67

TRADE NAME	Telechron, Model 8H67 "Musalarm"
SUPPLIER	Telechron Inc., Ashland, Mass.
TYPE SET	AC Operated Superheterodyne Receiver with Electric Clock
TUBES (FIVE)	Types, 12SA7GT Converter, 12SK7 IF Amp., 12SQ7 Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	105-125 Volts AC
TUNING RANGE—BROADCAST	540-1600KC RATING .26 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.05 MFD	High side to Pin 4 (grid) of 12SK7. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2	.05 MFD	High side to Pin 8 (grid) of 12SA7. Low side to B-.	"	"	"	A3,A4	Adjust for maximum output.
3	200MMFD	High side to external antenna lead. Low side to B-.	1620KC	"	"	A5	" " " "
4	200MMFD	"	1500KC	Tune for maximum output.	"	A6	" " " "

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DATE 8/48-#4814-23 SET #44-FOLDER #23

PARTS LIST AND DESCRIPTIONS

TELECHRON MODEL 8H67 "MUSALARM"

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TELECHRON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12SA7GT	12SA7GT	8AD	
2	IF Amp.	12SK7	12SK7	8N	
3	Det.-AVC-AF	12SQ7	12SQ7	8Q	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TELECHRON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	50	150	RCE-050	PRSA150/50-50	EDL4415	DSB-2x50-150	TA-440	Filter-Red
B	50	150						" "
7	.05	600	UCC-635	684-05	DT6S5	ST-6-05	TC-15	Line Filter
8	.003	600	UCC-623	684-003	DT6D3	ST-6-003	TC-23	Output Plate Bypass
9	.01	600	UCC-630	684-01	DT6S1	ST-6-01	TC-11	Audio Coupling
10	.01	200		484-01	DT2S1	ST-4-01	TC-11	" "
11	.05	200		484-05	DT2S5	ST-4-05	TC-15	AVC Bypass
12	.05	400		484-05	DT4S5	ST-4-05	TC-15	RF Bypass Pwr. Supply
13	.01	400		484-01	DT4S1	ST-4-01	TC-11	Ant. Coupling
14	.05	400		484-05	DT4S5	ST-4-05	72P1	Line Isolation
15	220	500	UCU-036	1468-0002	5W5T2	MO.5-32	1FM-32	AF Plate Bypass
16	330	500	UCU-040	1468-0003	5W5T3	MO.5-33	1FM-33	RF Filter
17	47	300	UCW-020	1469-00005	5R5Q5	MOS.5-45	MS-45	Osc. Grid Cap.-Cer.

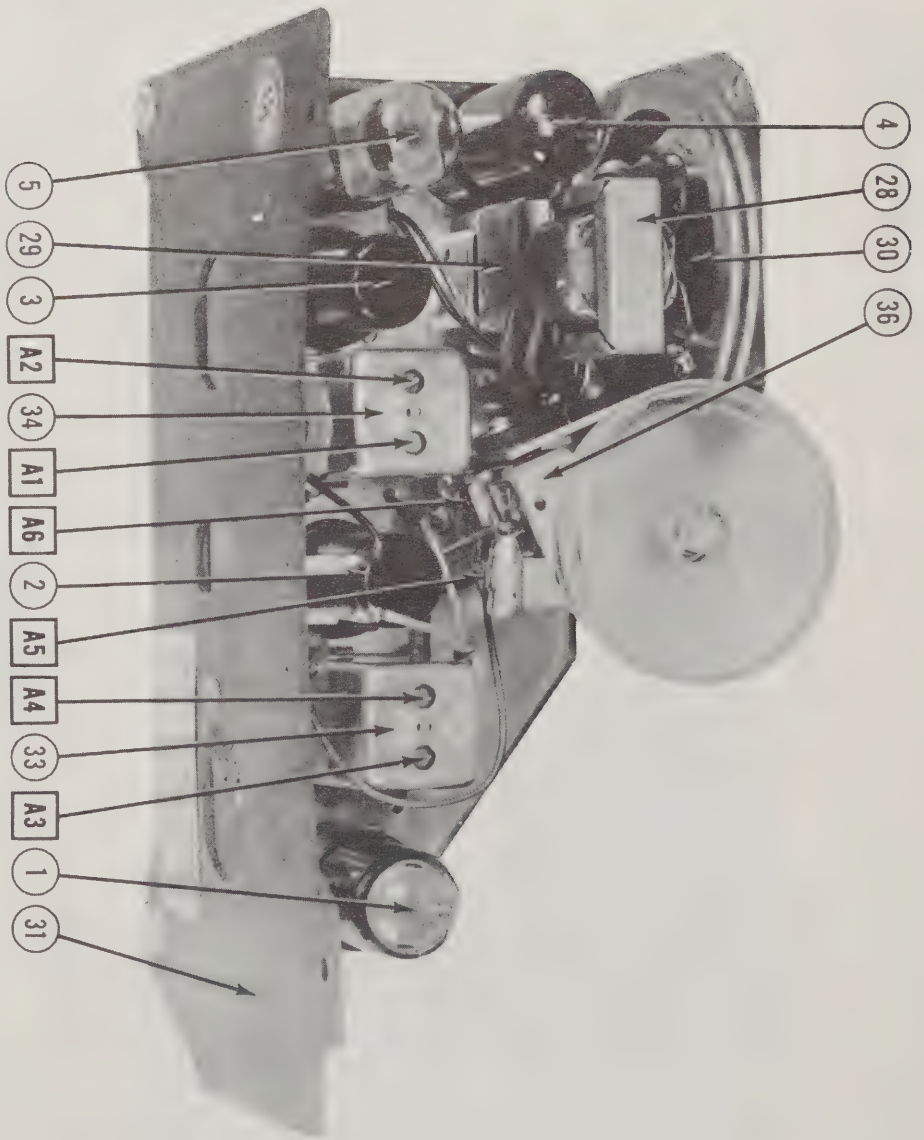
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TELECHRON PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
18A	500KΩ	½	RRC-053	D13-133	AM-60-Z	Volume Control
B	Shaft		Not Req.	E	KSS-3	Attach to 18A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TELECHRON PART No.	IRC PART No.	IDENTIFICATION CODES
19	22KΩ	½	URD-081	BTS-22K	Red-Red-Or. Osc. Grid
20	2.2 Meg.	½	URD-129	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
21	6.8 Meg.	½	URD-141	BTS-6.8 Meg.	Blue-Gray-Grn. AF Grid
22	470KΩ	½	URD-113	BTS-470K	Yl.-Vi.-Yl. AF Plate Load
23	470KΩ	½	URD-113	BTS-470K	Yl.-Vi.-Yl. Output Grid
24	150Ω	½	URD-029	BW-½-150	Br.-Grn.-Br. Output Cathode
25	1200Ω	2	URF-051	BT-2-1200	Br.-Red-Red- Filter
26	470KΩ	½	URD-113	BTS-470K	Yl.-Vi.-Yl. Line Isolation
27	18Ω	1	RRW-008	BW-1-18	Br.-Gray-Blk. Surge Limiter

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		TELECHRON PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
28	2200Ω	3.4Ω	200Ω tapped @ 6Ω	.5Ω	RTO-036	A-3330‡		A-3031‡	‡Bend mounting tabs down, file out slots and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			TELECHRON PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	VC IMP.		ST-113‡		
29	PM	3.4Ω	UOP-418	Mod. P4-X	4A07‡	‡Drill and tap magnet frame.
	CONE DIA.	VC DIA.				
30	4"	1/2"				

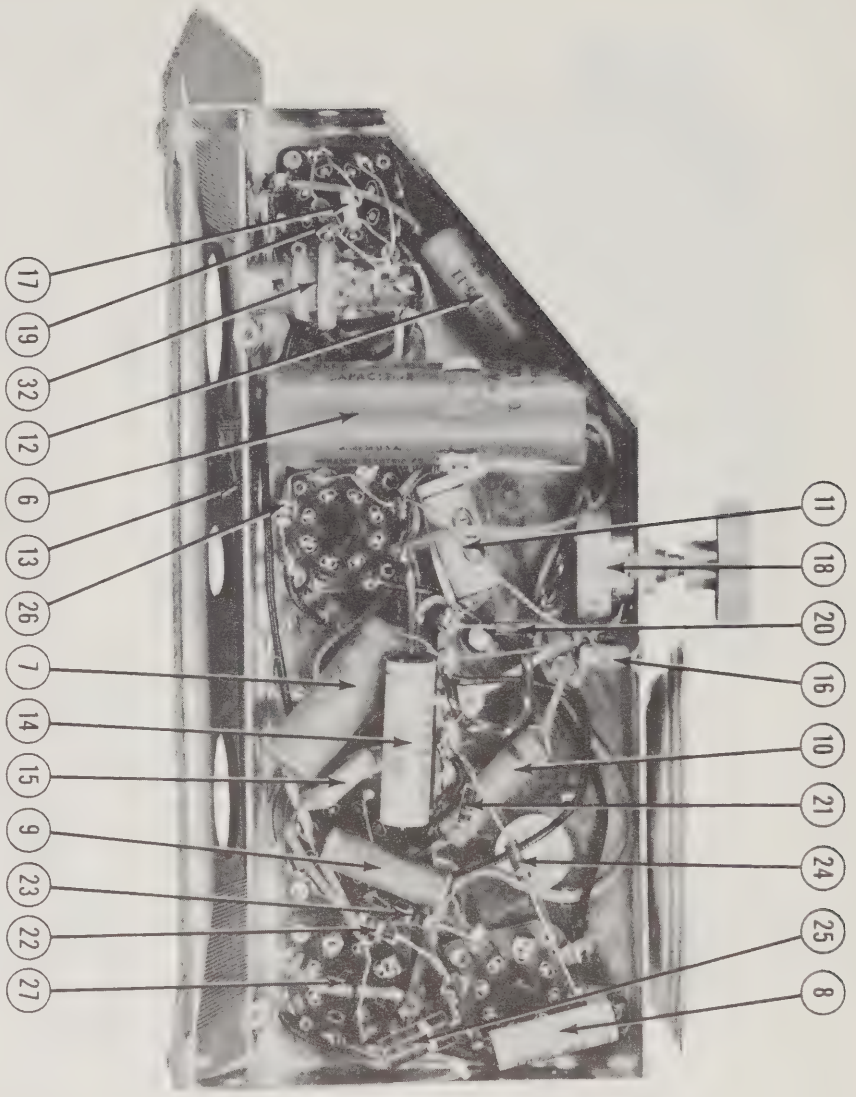
R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	TELECHRON PART No.	MEISSNER PART No.	
31	Loop Ant.	0Ω	1.6Ω	RAB-056		
32	Osc. Coil	.8Ω	8.7Ω	RLC-051	14-1060*	*Add 50 MMFD from high side of tuning cap. to osc. grid.
33	Input IF	17.2Ω	17.2Ω	RTL-050	16-6658	
34	Output IF	28.2Ω	27.8Ω	RTL-051	16-6660	

MISCELLANEOUS

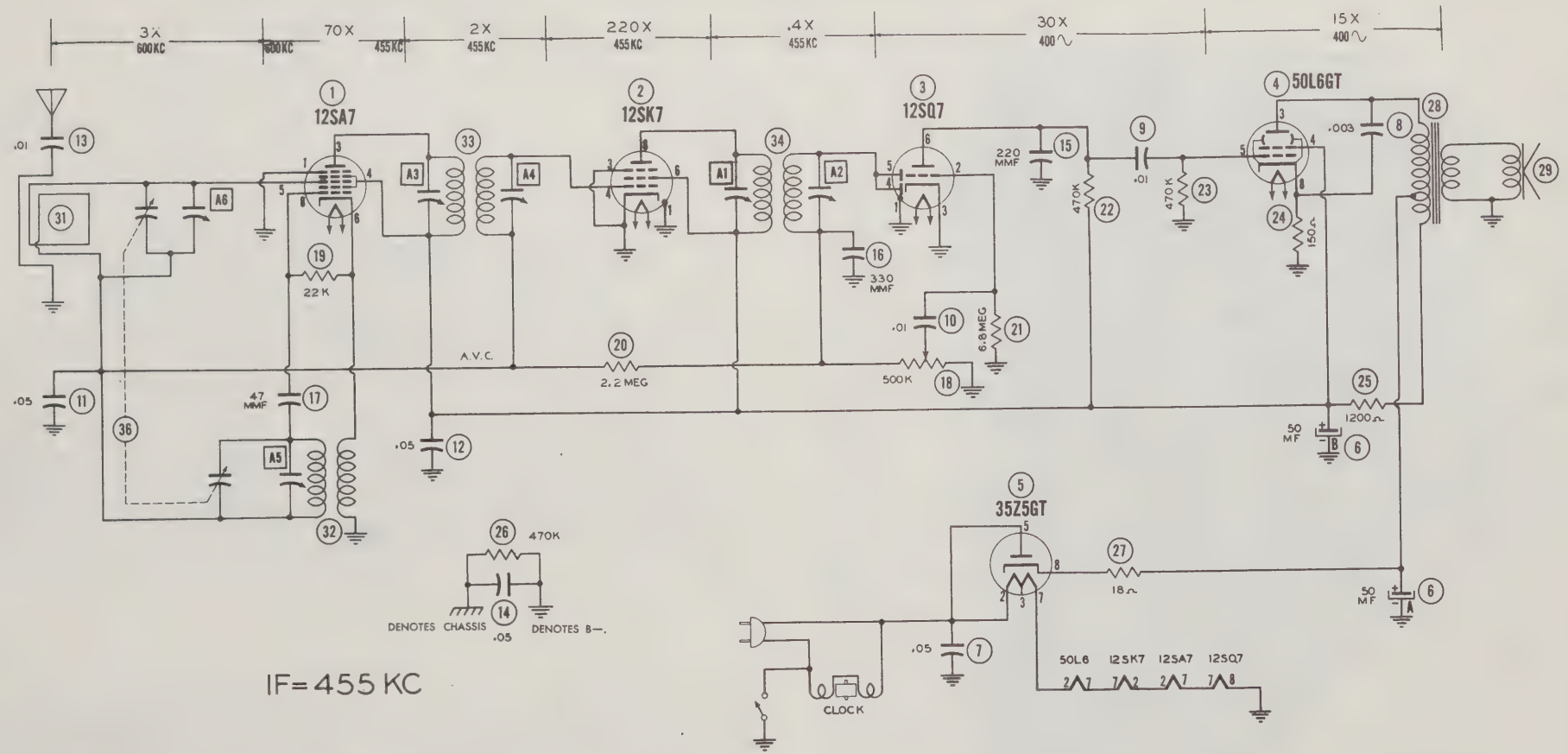
ITEM No.	PART NAME	TELECHRON PART No.	NOTES
35	Switch	C40X76	Assembly
36	2 Gang Var. Cap	RCT-021	(30-490MMF, 45-175 MMF)
	Cabinet	RAU-022	
	Dial Scale	RDS-047	
	Knob	RDK-093	Volume
	"	RDK-094	Tuning

CHASSIS—BOTTOM VIEW



TELECHRON MODEL 8H67 "MUSALARM"

TELECHRON MODEL 8H67 "MUSALARM"



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0V.	25VAC	90VDC	90VDC	-9.8VDC§	0V.	12VAC	-.6VDC
2	12SK7	0V.	25VAC	0V.	-.6VDC	0V.	90VDC	37VAC	90VDC
3	12SQ7	0V.	-.4VDC	0V.	-.4VDC	-.4VDC	45VDC	12VAC	0V.
4	50L6GT	0V.	85VAC	120VDC	90VDC	0V.	0V.	37VAC	6VDC
5	35Z5GT	0V.	117VAC	110VAC	125VDC	117VAC	125VDC	85VAC	125VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	470KΩ	25Ω	100KΩ	100KΩ	22KΩ	.8Ω	13Ω	2.7 Meg.
2	12SK7	470KΩ	25Ω	0Ω	2.7 Meg.	0Ω	100KΩ	38Ω	100KΩ
3	12SQ7	470KΩ	6.8 Meg.	0Ω	500KΩ	500KΩ	570KΩ	13Ω	0Ω
4	50L6GT	INF.	85Ω	100KΩ	150Ω	470KΩ	INF.	38Ω	150Ω
5	35Z5GT	INF.	120Ω	110Ω	100KΩ	120Ω	0Ω	85Ω	100KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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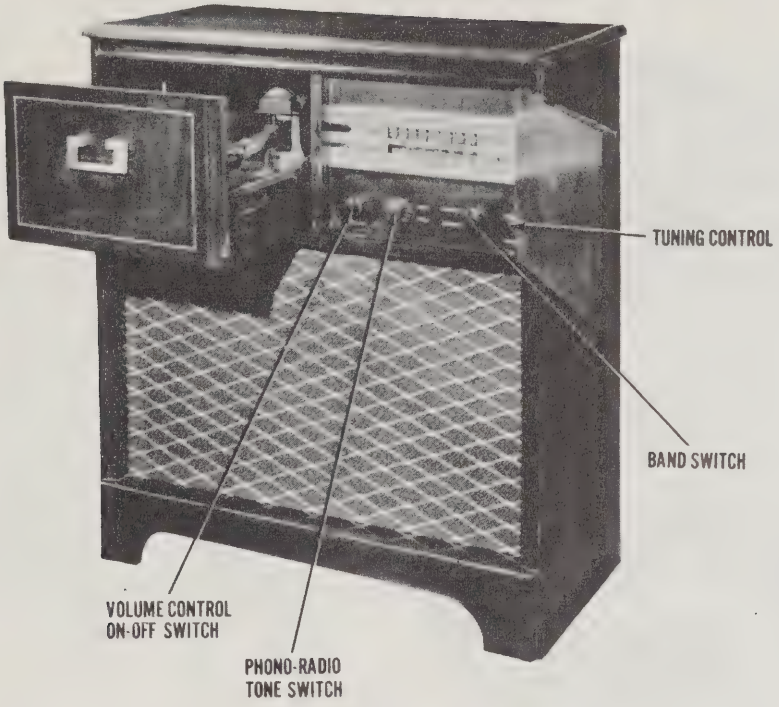
4814-23

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

TEMPLE MODELS
G-622, H-622



TEMPLE MODELS
G-622, H-622

TEMPLE MODEL H-622

TRADE NAME	Temple, Models G-622, H-622
MANUFACTURER	Templetone Radio Mfg. Corp., Garfield Ave., New London, Conn.
TYPE SET	AC Operated Combination Phono-Radio, 2 Band Superheterodyne Receiver with Loop Antenna
TUBES (SIX)	Types, 12SA7GT Converter, 12SG7 IF Amp., 12SQ7 Det.-AVC-AF, 35L6GT Power Output, 50L6GT Power Output, 117Z6GT Rectifier.
POWER SUPPLY	105-125 Volts AC — RATING .41 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	532-1700KC — SHORT WAVE 5.6-12.5MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and chassis.
Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01 MFD.	High side to rear stator of tuning cap. Low side to chassis.	455KC	BC (Counter-clock-wise)	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2	.01 MFD.	"	1700KC	"	"	"	A5	Adjust for maximum output.
3	.01 MFD	"	12.5MC	SW (Clock-wise)	"	"	A6	" " " "
4	39MMFD	High side to ant. terminal "A". Low side to chassis.	600KC	BC	Tune for max-imum output.	"	A7	" " " "
5	39MMFD	"	1550KC	"	"	"	A8	Adjust for maximum output. Repeat Steps 4 and 5 until no further improvement can be made.
6	39MMFD	"	6MC	SW	"	"	A9	Rock tuning cap. and adjust for maximum output.
7	39MMFD	"	10.5MC	"	"	"	A10	Rock tuning cap. and adjust for maximum output. Repeat Steps 6 and 7 until no further improvement can be made.

DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs.
2. Remove the Phillips head screws holding panel on back of cabinet. Remove panel from cabinet.
3. Remove antenna, phono-motor, phono-pickup and speaker plugs from chassis.
4. Remove three Phillips head wood screws holding chassis in cabinet. Remove chassis from cabinet.
5. Remove four hex nuts holding speaker in cabinet. Remove speaker from cabinet.

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DATE 8/48-#4814-24 SET #44-FOLDER #24

PARTS LIST AND DESCRIPTIONS

TEMPLE MODELS G-622, H-622

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TEMPLE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12SA7GT	12SA7GT	8AD	
2	IF Amp.	12SG7	12SG7	8BK	
3	Det.-AVC-AF	12SQ7GT	12SQ7GT	8Q	
4	Power Output	35L6GT	35L6GT	7AC	
5	" "	50L6GT	50L6GT	7AC	
6	Rectifier	117Z6GT	117Z6GT	7Q	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TEMPLE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	50	150		AF1010D*	BR5015	M-50-150		Filter- Blue + Brown -
B	100	150		PRS150/50	EZ5515*	DH-2x50-150*		" - Red + Black -
8	.02	400		484-.02	DT4S2	ST-4-02	TC-12	Output Plate Bypass
9	.005	400		484-.005	DT6D5	ST-6-005	TC-25	Audio Coupling
10	.005	400		484-.005	DT6D5	ST-6-005	TC-25	" "
11	.1	400		484-.1	DT4P1	ST-4-1	TC-1	Phono Isolation
12	.003	600		684-.003	DT6D3	ST-6-003	TC-23	Tone Comp.
13	.003	600		684-.003	DT6D3	ST-6-003	TC-23	" "
14	.1	200		484-.1	DT2P1	ST-2-1	TC-1	Bias Filter
15	.1	400		484-.1	DT4P1	ST-4-1	TC-1	Conv. Screen Bypass
16	.02	400		484-.02	DT4S2	ST-4-02	TC-12	IF Decoupling
17	.1	200		484-.1	DT2P1	ST-2-1	TC-1	AVC Bypass
18	.01	600		684-.01	DT6S1	ST-6-01	TC-11	Ext. Ant. Isolation
19	.1	400		484-.1	DT4P1	ST-4-1	TC-1	Line Filter
20	100	500		1468-.0001	5W5T1	MO.5-31	1FM-31	AF Plate Bypass
21	470	500		1468-.0005	5W5T5	MO.5-35	1FM-35	Tone Comp.
22	100	500		1468-.0001	5W5T1	MO.5-31	1FM-31	Osc. Grid Cap.
23	910	500						Conv. Grid Filter
24	100	500		1468-.0001	5W5T1	MO.5-31	1FM-31	Ant. Coupling

*Parallel sections to obtain desired capacity.

CONTROLS

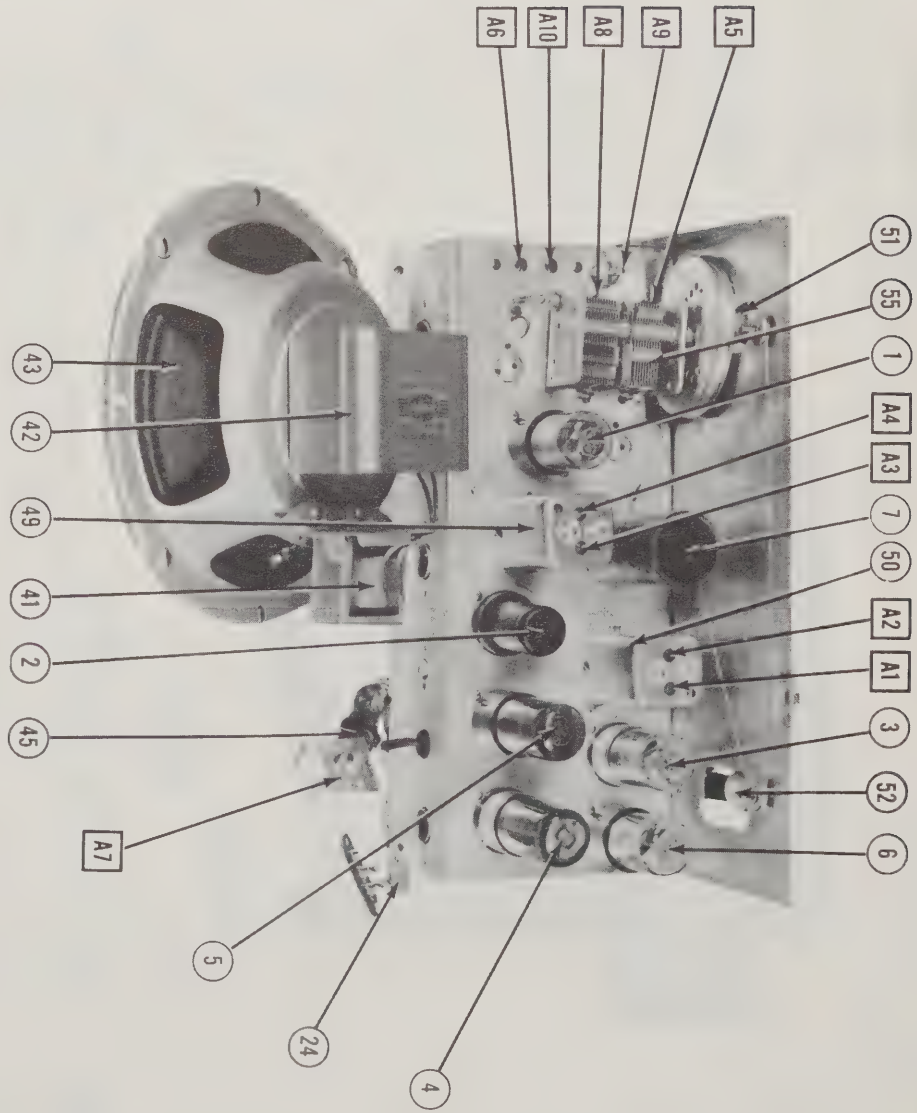
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TEMPLE PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
25	1 Meg.	½	RP11-105A			Volume Control & Sw. tapped @ 150KΩ & 300KΩ

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TEMPLE PART No.	IRC PART No.	IDENTIFICATION CODES
26	120KΩ	½		BTS-120K	Br.-Red-Yl. Conv. Grid
27	47Ω	½		BW-½-47	Yl.-Vi.-Blk. Parasitic Suppressor
28	22KΩ	½		BTS-22K	Red-Red-Or. Osc. Grid
29	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. AVC Network
30	1000Ω	½		BTS-1000	Br.-Blk.-Red IF Decoup.
31	3.9 Meg.	½		BTS-3.9 Meg.	Or.-White-Grn. AF Grid
32	390KΩ	½		BTS-390K	Or.-White-Yl. AF Plate Load
33	330KΩ	½		BTS-330K	Or.-Or.-Yl. Output Grid
34	47Ω	½		BW-½-47	Yl.-Vi.-Blk. Parasitic Supp.
35	680KΩ	½		BTS-680K	Blue-Gray-Yl. Tone Comp.
36	22KΩ	½		BTS-22K	Red-Red-Or. Tone Comp.
37	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Series Phono
38	1200Ω	2		BT-2-1200	Br.-Red-Red Filter
39	68Ω	1		BW-1-68	Blue-Gray-Blk. Bias
40	18Ω	2		BW-2-18	Br.-Gray-Blk. Rect. Ballast-See Note

Note-Some models use two 33Ω 1W resistors in parallel in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		TEMPLE PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
41	1200Ω	4.3Ω	50Ω	.6Ω	Part of EH-18		T22S87		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			TEMPLE PART No.	JENSEN PART No.	QUAM PART No.	
42	FIELD PM	VC IMP. 4.3Ω	EH-18	ST-117 Mod. P8-T	8A31	
43	CONE DIA. 7½"	VC DIA. 1"				

R F COILS

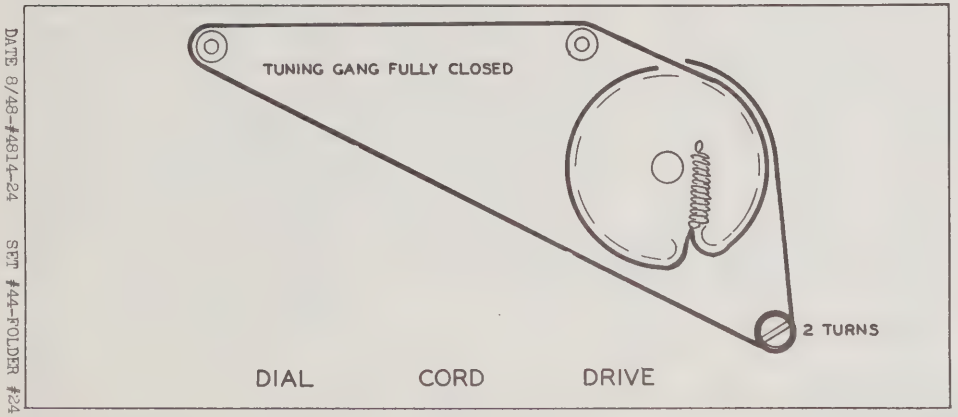
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	TEMPLE PART No.	MEISSNER PART No.	
44	Loop Ant.		0Ω			
45	BC Ant.Coil	29Ω	2.8Ω			
46	SW " "	.4Ω	.1Ω	LR-16		
47	BC Osc. "		5.7Ω	LO-2	14-1060†	†Add 50MMFD from high side tuning cap. to osc. grid.
48	SW " "		0Ω	LO-12		
49	Input IF	17Ω	16Ω	TM2-1	16-6658	
50	Output IF	16Ω		TM2-3	16-6670	

DIAL LIGHT

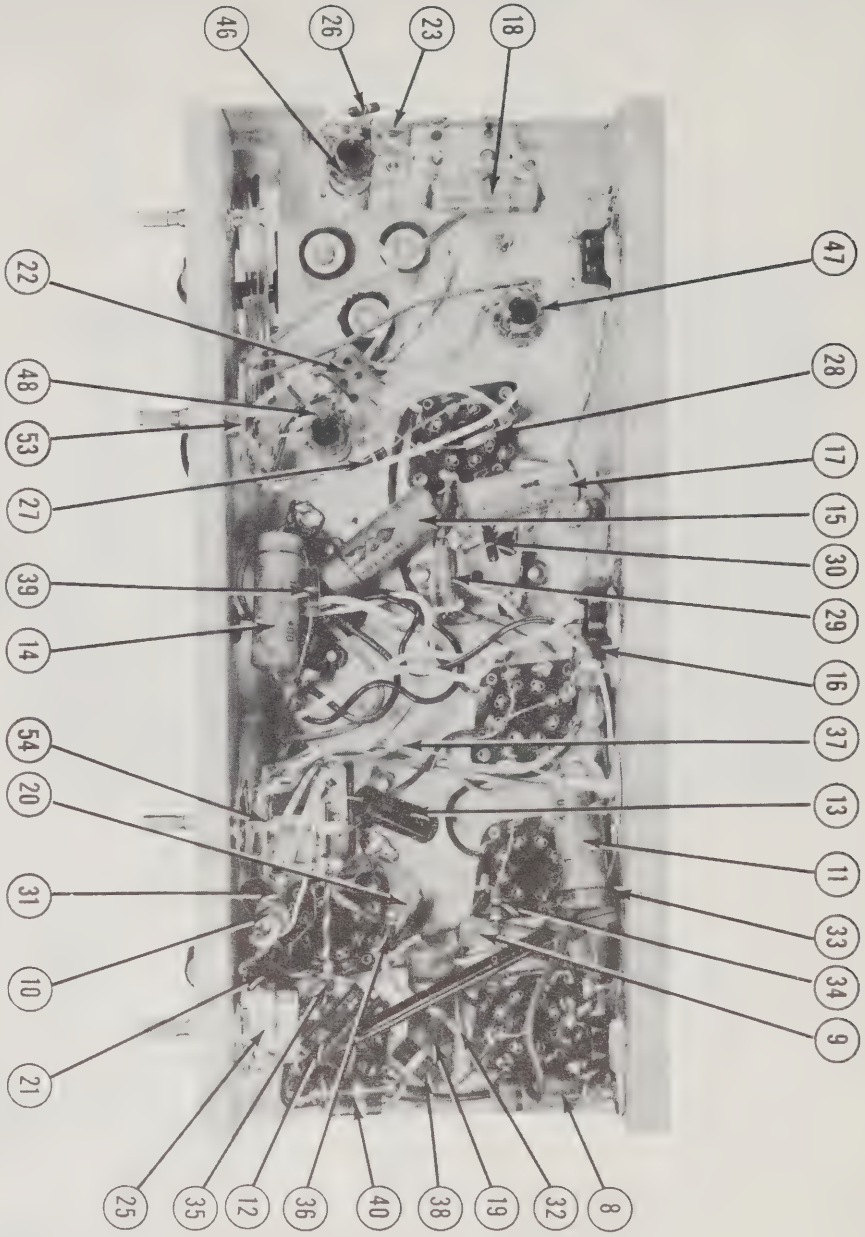
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					TEMPLE PART No.		
51	Screw	120					Type C7
52	"	120					" "

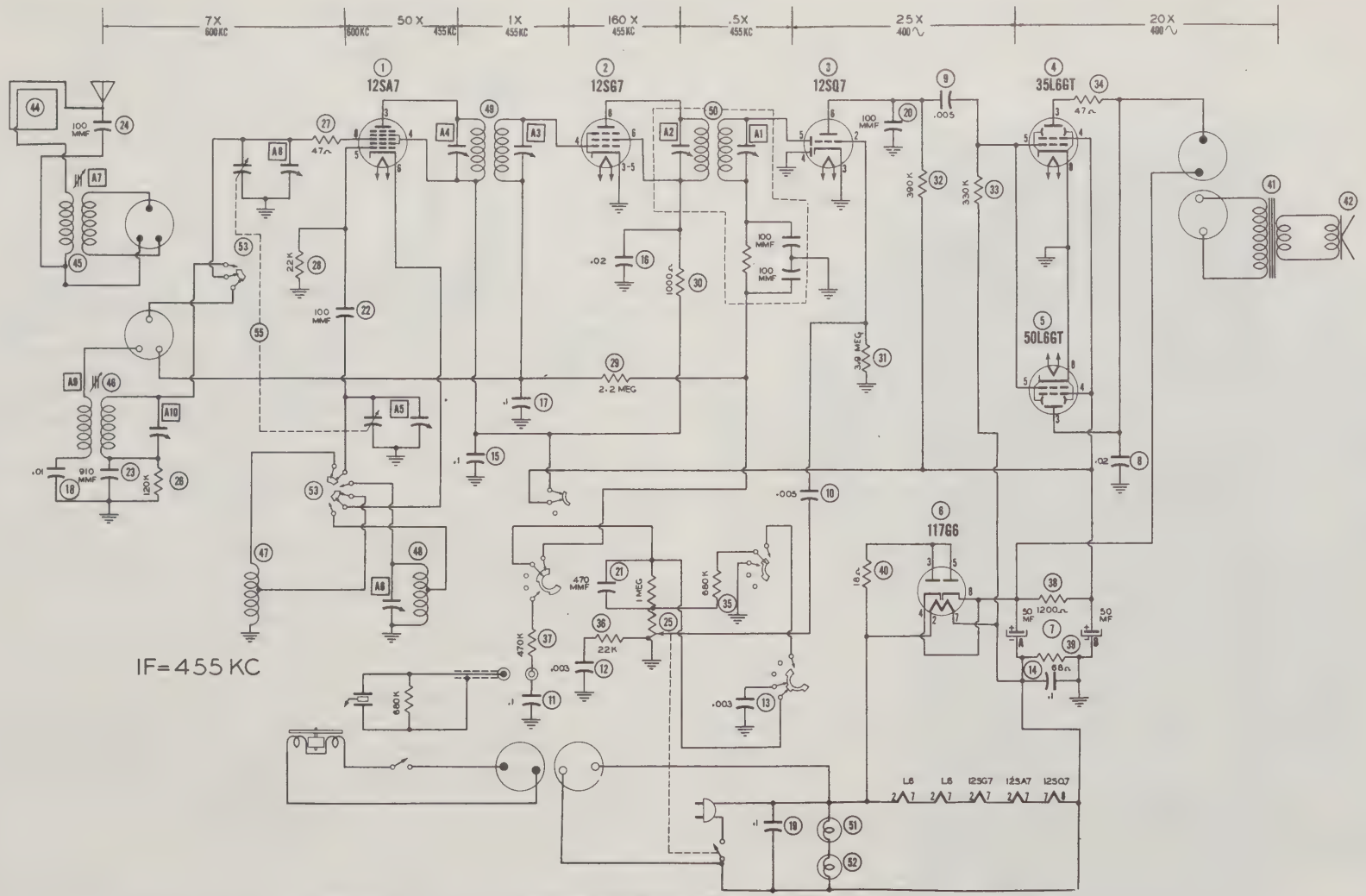
MISCELLANEOUS

ITEM No.	PART NAME	TEMPLE PART No.	NOTES
53	Switch	SR24	Band
54	"	SR27	Radio-Phono-Tone
55	2 Gang Var. Cap.	CV16	(23-450MMF, 27-195MMF)



CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0V.	13VAC	95VDC	95VDC	-7.4VDC§	0V.	25VAC	-.6VDC
2	12SG7	0V.	25VAC	0V.	-.6VDC	0V.	90VDC	36VAC	90VDC
3	12SQ7GT	0V.	-.1VDC	0V.	0V.	-.6VDC	45VDC	13VAC	3.5VAC
4	35L6GT	95VDC	86VAC	115VDC	95VDC	-2.8VDC	0V.	117VAC	0V.
5	50L6GT	0V.	36VAC	115VDC	95VDC	-2.8VDC	-3.2VDC	85VAC	0V.
6	117Z6GT	0V.	117VAC	105VAC	120VDC	105VAC	0V.	3.5VAC	120VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0Ω	80Ω	41KΩ	41KΩ	22KΩ	.6Ω	90Ω	3 Meg.
2	12SG7	0Ω	90Ω	0Ω	3.3 Meg.	0Ω	42KΩ	100Ω	42KΩ
3	12SQ7GT	0Ω	0Ω	3.9 Meg.	0Ω	0Ω	1 Meg.	430KΩ	80Ω	70Ω
4	35L6GT	41KΩ	130Ω	40KΩ	41KΩ	330KΩ	INF.	140Ω	0Ω
5	50L6GT	0Ω	100Ω	40KΩ	41KΩ	330KΩ	65Ω	130Ω	0Ω
6	117Z6GT	INF.	140Ω	150Ω	40KΩ	150Ω	INF.	70Ω	40KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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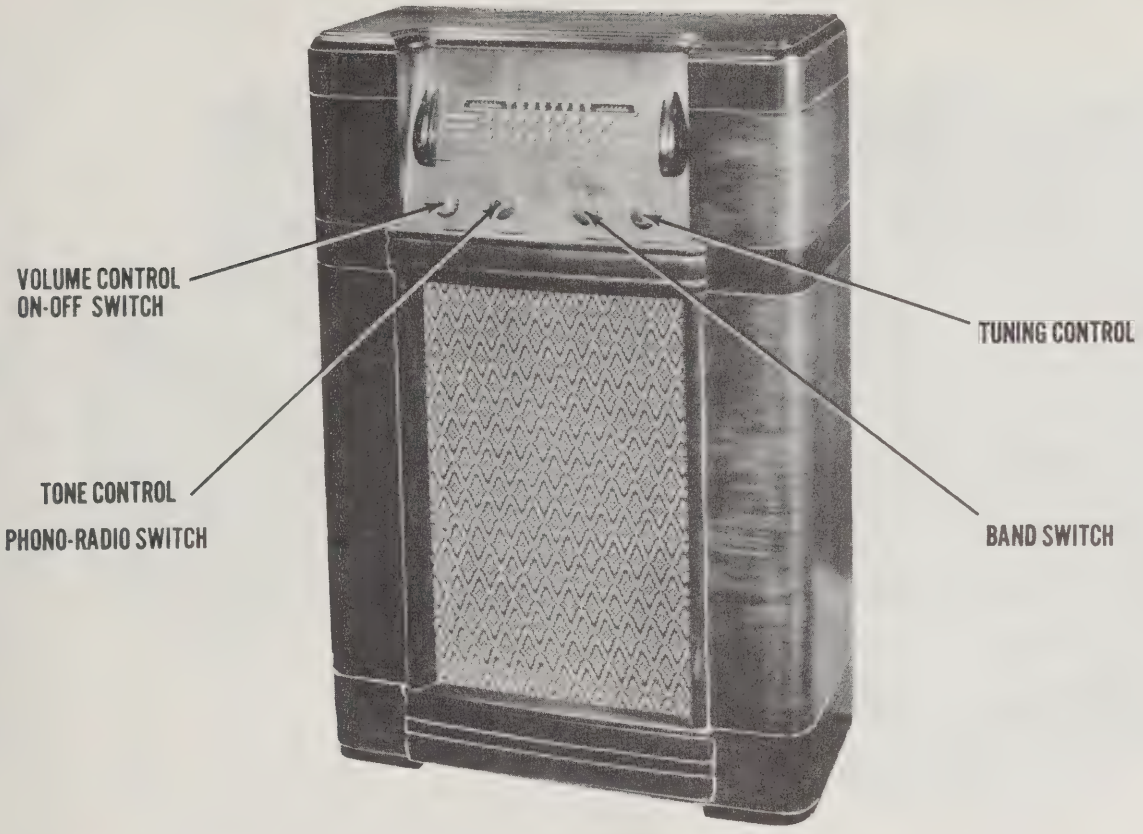
The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

TRUETONE MODEL D1835
(Fact. Model 25A86-856)



TRUETONE MODEL D1835
(Fact. Model 25A86-856)

TRUETONE MODEL D1835

TRADE NAME	Truetone, Model D1835 (Factory Model 25A86-856)
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	AC Operated 2 Band Superheterodyne Receiver with Loop Antenna
TUBES (SIX)	Types, 6SA7 Converter, 6SK7 1st IF Amp., 6SF7 2nd IF Det.-AVC, 6SJ7 AF Amp., 6V6GT Power Output, 6X5GT Rectifier.
POWER SUPPLY	105-125 Volts AC — RATING .36 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC — SHORT WAVE 5.75-18.3MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position, output of signal gen. should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to Pin 8 (grid) of 6SA7. Low side to chassis.	455KC	BC (fully counter-clock-wise)	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output
2	50MMFD.	High side to ext. ant. lead. Low side to chassis.	1620KC	"	"	"	A5	" " " "
3	50MMFD.	"	1400KC	"	Tune for maximum output.	"	A6	" " " "
4	50MMFD.	"	600KC	"	"	"	A7	Rock tuning cap. and adjust for maximum output. Repeat Steps 2, 3 & 4 until no further improvement can be made.
5	400Ω carbon res.	"	18.3MC	SW (fully clock-wise)	Tuning cap. fully open.	"	A8	Adjust for maximum output
6	"	"	16MC	"	Tune for maximum output.	"	A9	Rock tuning cap. and adjust for maximum output. Reinstall receiver in cabinet.
7	50MMFD	"	1400KC	BC	"	"	A6	Set dial pointer to 1400KC calibration mark. Adjust for maximum volume

HOWARD W. SAMS & CO., INC. Indianapolis Indiana

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DATE 8/48-#4814-25 SET #44-FOLDER #25

PARTS LIST AND DESCRIPTIONS

TRUETONE MODEL D1835

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	6SA7	6SA7	8R	
2	1st IF Amp.	6SK7	6SK7	8N	
3	2nd IF-Det.-AVC	6SF7	6SF7	7AZ	
4	AF Amp.	6SJ7	6SJ7	8N	
5	Power Output	6V6GT	6V6GT	7AC	
6	Rectifier	6X5GT	6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	40	450	45X346		UP4445C	DY-314	EL-424†	● Filter
B	40	450						■ "
C	20	25						▲ Cathode Bypass
8	.004	800	H66402	684-004	DT6D4	ST-6-004	TC-24	Output Plate Bypass
9	.004	400	D66402	484-004	DT6D4	ST-6-004	TC-24	Tone Compensation
10	.01	400	D66103	484-01	DT4S1	ST-4-01	TC-11	Audio Coupling
11	.025	400	D64253	484-03	DT4S3	ST-4-03	TC-13	AF Plate Decoupling
12	.1	400	D67104	484-.1	DT4P1	ST-4-1	TC-1	AF Screen Bypass
13	.005	400	D66502	484-005	DT6D5	ST-6-005	TC-25	Audio Coupling
14	.04	400	D66403	484-04	DT4S4	ST-4-04	TC-14	Tone Comp.
15	.04	400	D66403	484-04	DT4S4	ST-4-04	TC-14	Screen Bypass
16	.05	200	B66503	484-05	DT2S5	ST-4-05	TC-15	AVC Filter
17	.04	400	D66403	484-04	DT4S4	ST-4-04	TC-14	Conv. Screen Bypass
18	.0005	400	B66501	1468-0005	DT6T5	ST-6-0005	TC-35	RF Coupling
19	.00475	180	46X289					Fixed Padder
20	470	500	47X467	1468-0005	5W5T5	MO.5-35	1FM-35	AF Plate Bypass
21	47	500	47X463	1468-00005	5W5Q5	MO.5-45	1FM-45	Tone Compensation
22A	50	500	47X112	1468-00005	5W5Q5	MO.5-45	1FM-45	Diode RF Filter
B	50	500		1468-00005	5W5Q5	MO.5-45	1FM-45	" " "
23	68	500	47X466	1469-00007	5W5Q7	MOS.5-47	MS-47	Osc. Grid Cap.
24	47	500	47X463	1468-00005	5W5Q5	MO.5-45	1FM-45	IF Coupling-Cer.

†Parallel sections to obtain desired capacity.

CONTROLS

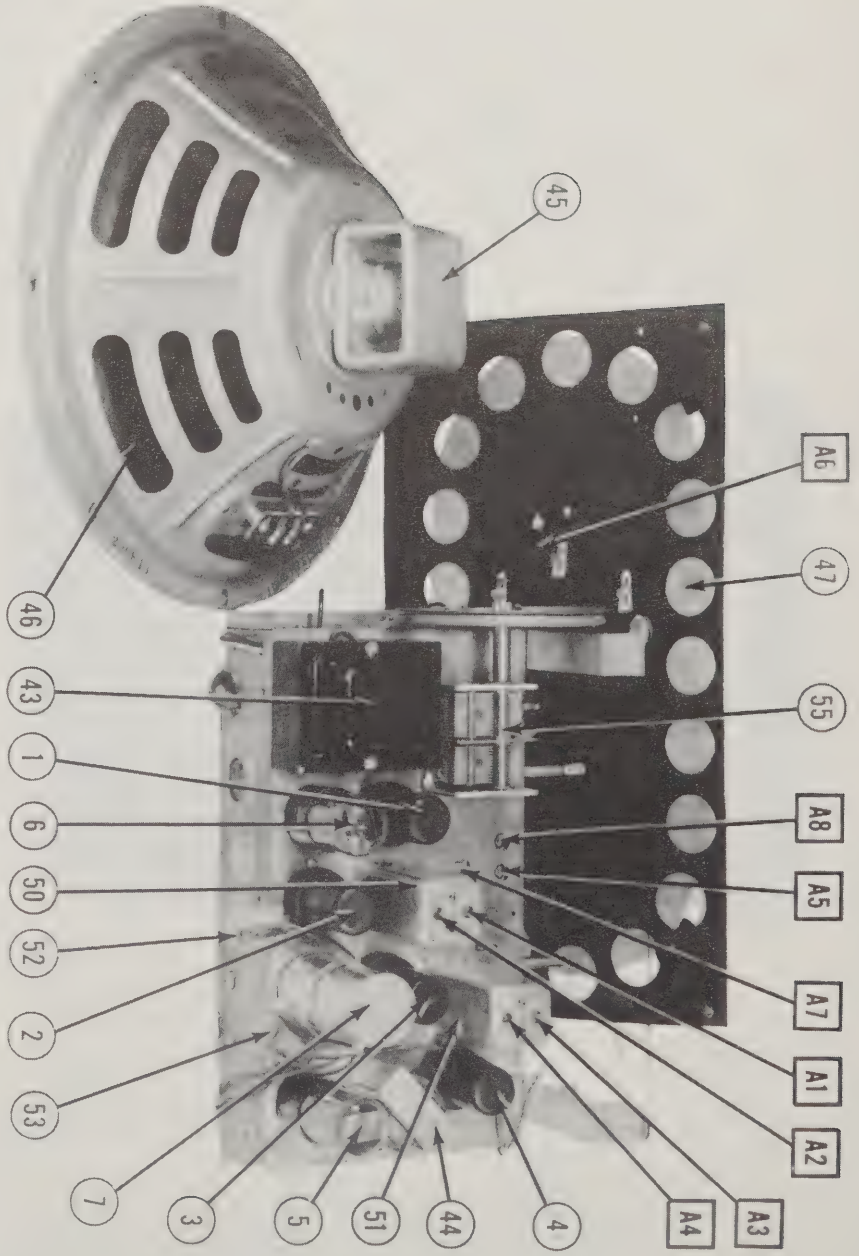
ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
25A	500KΩ	½	36X358	D13-133X	AT-92‡	Volume Control tapped @ 100KΩ
B	Shaft		Not Req.	E	KSS-3	Attach to 24A per instructions
C	Switch		" "	41	SW-A	" " " "
26	3 Meg.	½	40X276			Tone Control & Radio-Phono Switch
26A	3 Meg.	½	40X281	D13-140	AM-67-Z	Tone Control-See Note 1
B	Shaft		Not Req.	E	KSS-3	Attach to 25A per instructions

‡Use 100KΩ tap cut other tap off.
Note 1-Attach original arm to shaft to actuate radio-phono switch.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	IDENTIFICATION CODES
27	2.2 Meg.	½	B85225	BTS-2.2 Meg.	Red-Red-Grn. Conv. Grid
28	39KΩ	½	B84393	BTS-39K	Or.-White-Or. Osc. Grid
29	39KΩ	1	C84393	BTA-39K	Or.-White-Or. Conv. Screen
30	39KΩ	1	C84393	BTA-39K	Or.-White-Or. IF Screen
31	2200Ω	½	B84222	BTS-2200	Red-Red-Red 1st IF Plate Load
32	1 Meg.	½	B85105	BTS-1 Meg.	Br.-Blk.-Grn. 2nd IF Grid
33	2.2 Meg.	½	B85225	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
34	47KΩ	½	B85473	BTS-47K	Yl.-Vi.-Or. Diode Filter
35	15KΩ	½	B84153	BTS-15K	Br.-Grn.-Or. Tone Compensation
36	10 Meg.	½	B85106	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
37	470KΩ	½	B85474	BTS-470K	Yl.-Vi.-Yl. AF Screen
38	33KΩ	½	B84333	BTS-33K	Or.-Or.-Or. AF Plate Load
39	82KΩ	½	B84823	BTS-82K	Gray-Red-Or. AF Plate Decoupling
40	470KΩ	½	B85474	BTS-470K	Yl.-Vi.-Yl. Output Grid
41	270Ω	1	C84271	BW-1-270	Red-Vi.-Br. Output Cathode
42	1800Ω	2	D84182	BT-2-1800	Br.-Gray-Red Filter

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	TRUETONE PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
43	117V AC @ .36A	485V CT @ .06A DC	6.35V AC @ 2.5A		53X282		T-22R02#	

#Drill new mounting holes.

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		TRUETONE PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
44	3600Ω	3.2Ω	475Ω	.2Ω	51X134	A-3823	T22S87	A-2902	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			TRUETONE PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	VC IMP.				
45	PM	3.2Ω	12A486	ST-102* Mod. P12-S	12A6*	*Replace output transformer to match 6-8Ω voice coil.
	CONE DIA.	VC DIA.				
46	11-3/8"	1"				

R F COILS

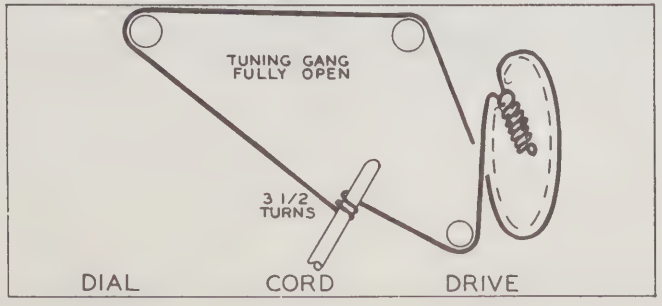
ITEM No.	USE	DC RES.		REPLACEMENT DATA	
		PRI.	SEC.	TRUETONE PART No.	MEISSNER PART No.
47	Loop Ant.	.1Ω	.5Ω	26A474	
48	SW Ant.Coil	1.3Ω	.1Ω	9A1917	
49A	BC Osc.Coil	.3Ω	5Ω	9A1918	
B	SW " "	0Ω	0Ω	9A1918	
50	Input IF	21Ω	21Ω	9A1814	16-6658
51	Output IF	20Ω	18Ω	9A1815	16-6660

DIAL LIGHT

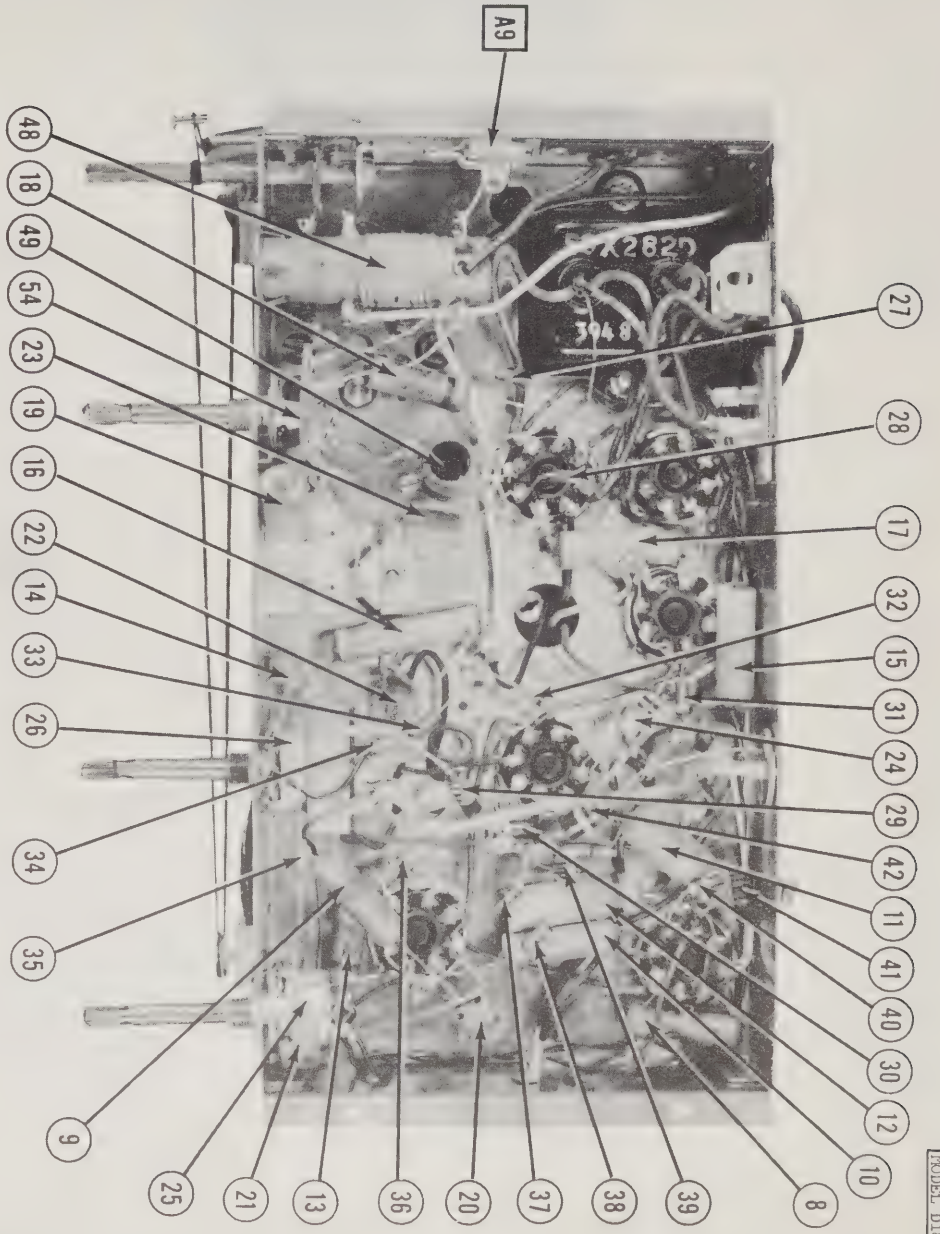
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					TRUETONE PART No.		
52	Bayonet	7.5	0.2	White	7A32		Type 51
53	"	7.5	0.2	"	7A32		" "

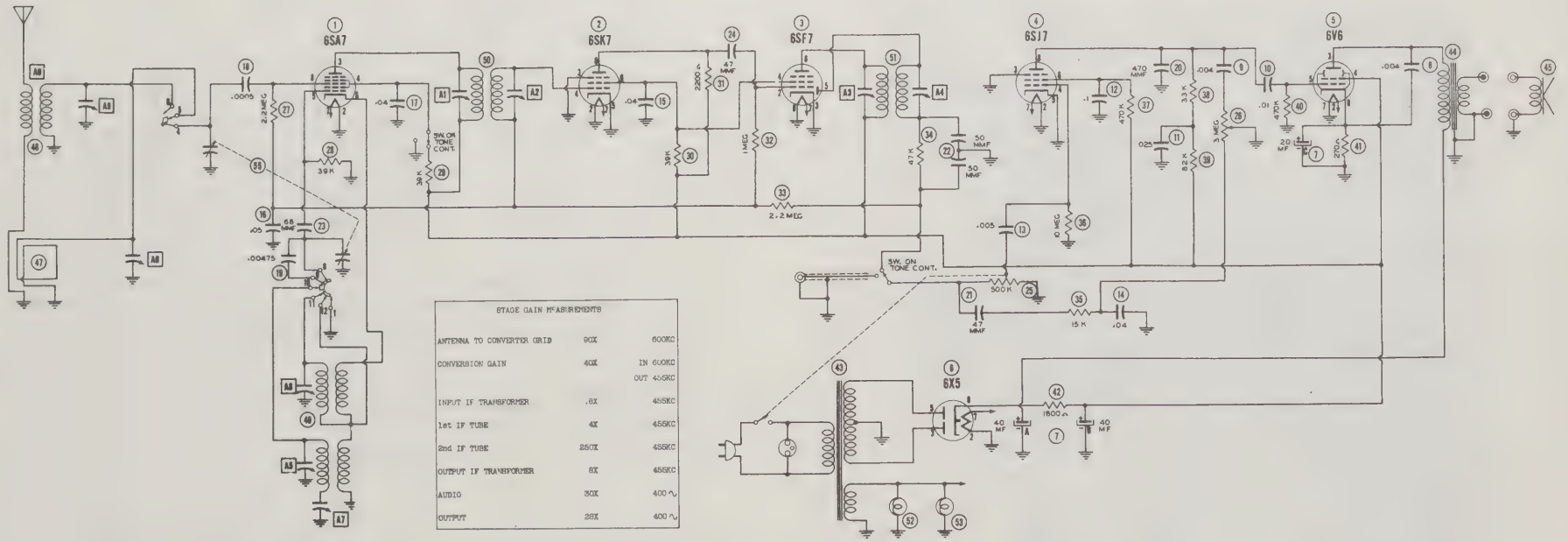
MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
54	Switch	2A372	Band
55	2 Gang Var. Cap.	14A184	(16-487MMF, 13-201MMF)
A5, A8	Trimmer Strip	17A109	BC Osc. Adj. / SW " "
A6	Trimmer	17A235	BC Ant. Adj.
A7	Padder	17A155	BC Osc. Adj.
A9	Trimmer	17A164	SW Ant. Adj.
	Dial	58X694	Glass
	Dial Pointer	15X229	



CHASSIS—BOTTOM VIEW





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VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SA7	0V.	0V.	200VDC	57VDC	-4.2VDC§	0V.	6.3VAC	-.3VDC
2	6SK7	0V.	0V.	0V.	-.3VDC	0V.	61VDC	6.3VAC	185VDC
3	6SF7	0V.	-.4VDC	0V.	61VDC	-.4VDC	200VDC	6.3VAC	0V.
4	6SJ7	0V.	0V.	0V.	-.5VDC	0V.	335VDC	6.3VAC	34VDC
5	6V6GT	0V.	6.3VAC	238VDC	200VDC	0V.	0V.	0V.	9VDC
6	6X5GT	0V.	0V.	245VAC	0V.	245VAC	0V.	6.3VAC	250VDC

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SA7	0Ω	0Ω	72KΩ	110KΩ	39KΩ	.3Ω	.1Ω	5 Meg.
2	6SK7	0Ω	0Ω	0Ω	2.7 Meg.	0Ω	110KΩ	.1Ω	74KΩ
3	6SF7	0Ω	3.7 Meg.	0Ω	110KΩ	560KΩ	72KΩ	.1Ω	.1Ω
4	6SJ7	0Ω	0Ω	0Ω	10 Meg.	0Ω	54KΩ	.1Ω	1.0KΩ
5	6V6GT	0Ω	.1Ω	70KΩ	72KΩ	470KΩ	.4Ω	.0Ω	270Ω
6	6X5GT	INF.	0Ω	168Ω	INF.	168Ω	INF.	.1Ω	70KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

TRUETONE MODELS D2806, D2807
(Fact. Model 181)

MODEL D2806

MODEL D2807

TRUETONE MODELS D2806, D2807
(Fact. Model 181)

TRUETONE MODEL D2806

TRADE NAME	Truetone, Models D2806, D2807 (Fact. Model 181)
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FOUR)	Types, 12BE6 Converter, 12AT6 Det.-AVC-AF, 50B5 Power Output, 35W4 Rectifier.
POWER SUPPLY	105-125 Volts AC-DC
TUNING RANGE—BROADCAST	532.5-1620KC RATING .25 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 MFD.	High side to Pin 7 (grid) of 12BE6. Low side to B-.	455KC	Tuning cap. fully open.	Across voice coil	A1,A2	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2	.1 MFD.	"	1620KC	"	"	A3	Adjust for maximum output.
3	75MMFD.	High side to junction of ant. hank & ant. coil (25). Low side to B-.	1400KC	Tune for maximum output.	"	A4	" " " "

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DATE 8/48-#4814-26 SET #44-FOLDER #26

PARTS LIST AND DESCRIPTIONS

TRUETONE MODEL D2806, D2807

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12BE6	12BE6	7CH	
2	Det.-AVC-AF	12AT6	12AT6	7BT	
3	Power Output	50B5	50B5	7BZ	
4	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
5A	40	150	CE-15	PRSA150/40-40	EDL4415	DSB-2x40-150	TA-440	Filter-Red
B	40	150					"	-Grn.
6	.02	400	CP203-1	484-02	DT4S2	ST-4-02	TC-12	Rectifier Bypass
7	.02	400	CP203-1	484-02	DT4S2	ST-4-02	TC-12	Output Plate Bypass
8	.005	400	CP502-3	484-005	DT6D5	ST-6-005	TC-25	Audio Coupling
9	.002	400	CP202-2	484-002	DT6D2	ST-6-002	TC-22	" "
10	.05	200	CP503-4	484-05	DT2S5	ST-4-05	TC-15	AVC Filter
11	.05	200	CP503-4	484-05	DT2S5	ST-4-05	72P1	Line Isolation
12	150	300	CM151-1	1468-00015	5W5T15	MO.5-315	1FM-315	Diode RF Filter-Cer.

CONTROLS

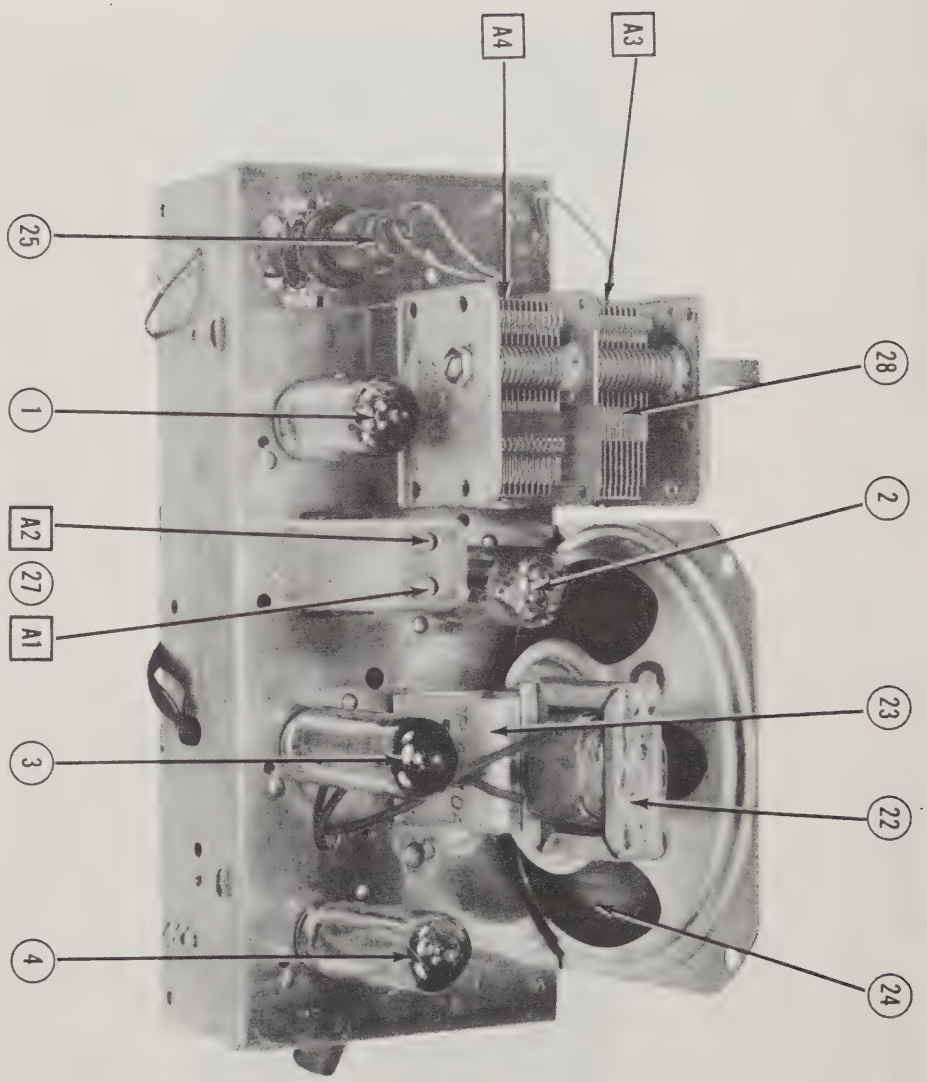
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
13A	2 Meg.		VC-11	D13-139#	M-66-Z#	Volume Control
B	Shaft		Not Req.	A	Not Req.	Attach to 13A per instructions
C	Switch		" "	41	SW-A	" " " "

#Install a 100KΩ resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control (Controls viewed from shaft side, terminals down.)

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	IDENTIFICATION CODES
14	18KΩ	½	RC183-2	BTS-18K	Br.-Gray-Or. Osc. Grid
15	5.1 Meg.	½	RC515-1	BTS-4.7 Meg.	Grn.-Br.-Grn. AVC Network
16	330KΩ	½	RC354-1	BTS-330K	Or.-Grn.-Yl. Output Grid
17	10 Meg.	½	RC106-1	BTS-10 Meg.	Br.-Blk.-Blue AF Grid
18	220KΩ	½	RC224-1	BTS-220K	Red-Red-Yl. AF Plate Load
19	2200Ω	1	RC222-4	BTA-2200	Red-Red-Red Filter
20	39Ω	1	RC390-4	BW-1-39	Or.-White-Blk. Rect. Ballast
21	18Ω	½	RC180-1	BW-½-18	Br.-Gray-Blk. Line Dropping

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		TRUETONE PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	
	PRI.	SEC.	PRI.	SEC.					
22	27002	3.32	2752	.82	TR-10	A-3876‡	T22S45‡	A-2928‡	‡Bend mounting tabs down, file out slots and mount on original brackets.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			TRUETONE PART No.	JENSEN PART No.	QUAM PART No.	
23	FIELD PM	VC IMP. 3.32	SP-47-10A	ST-113 Mod. P4-X	4A15	
24	CONE DIA. 4"	VC DIA. 1/2"				

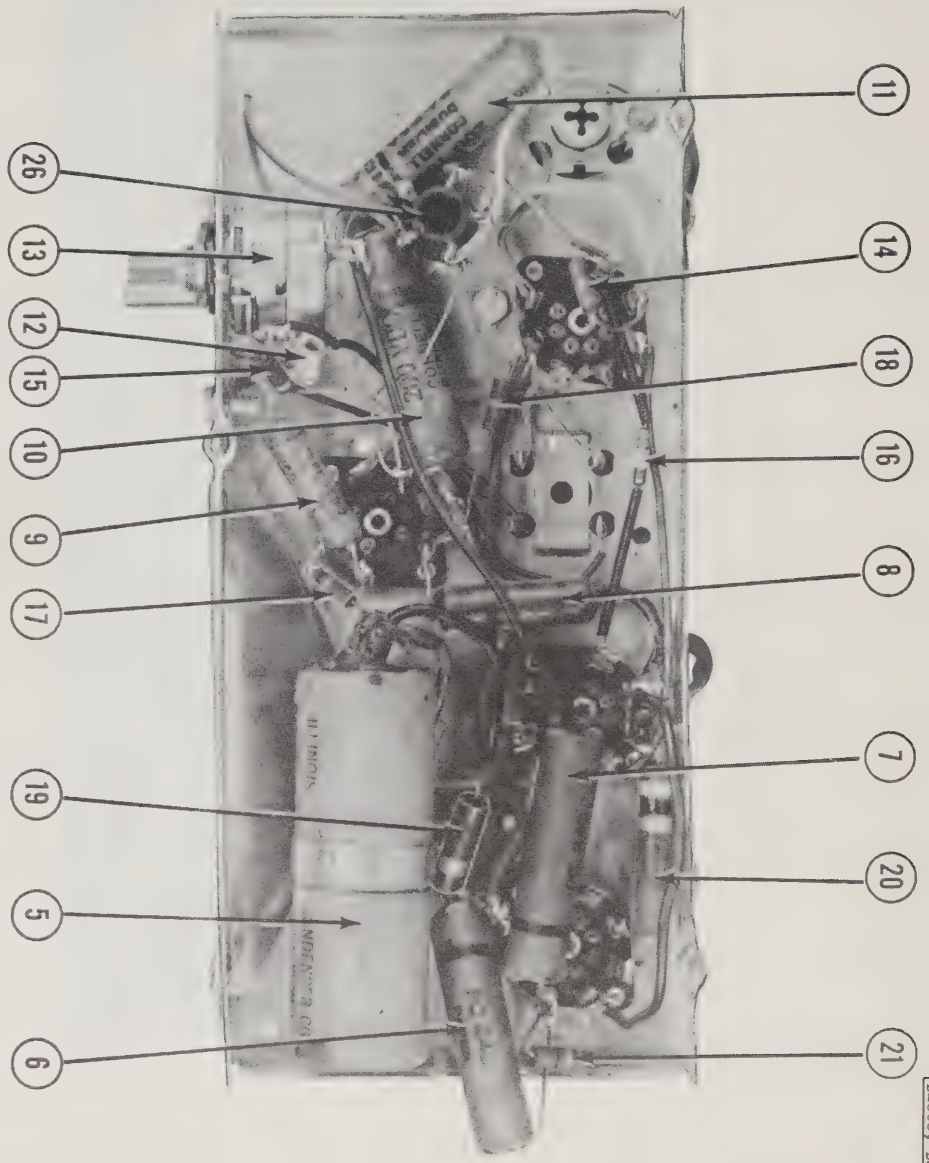
R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	TRUETONE PART No.	MEISSNER PART No.	
25	Ant. Coil	682	2.82	LA-5	14-1056	
26	Osc. Coil	.72	6.12	LC-6	14-1060*	*Add 50MMFD cap. from high side of tuning cap. to osc. grid.
27	IF Trans.	192	192	LF-24	16-6678	

MISCELLANEOUS

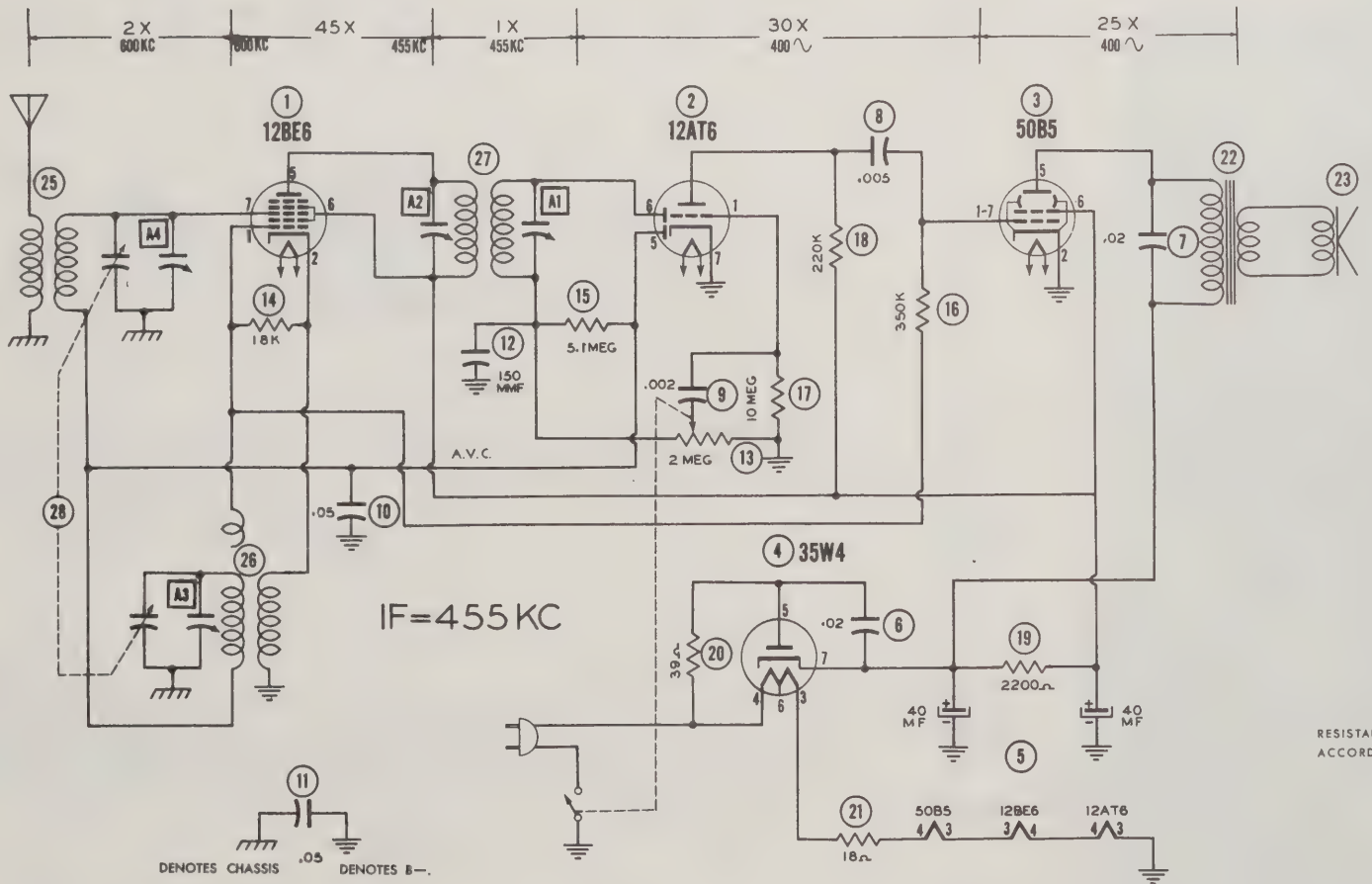
ITEM No.	PART NAME	TRUETONE PART No.	NOTES
28	2 Gang Var. Cap.	CV-14	(45-475MMF, 45-205MMF)
	Cabinet	CB-106	(Specify Ivory or Walnut)
	Knob	KN-20	Volume-On-Off
	"	KN-21	Tuning

CHASSIS—BOTTOM VIEW



TRUETONE MODELS D2806, D2807

DATE 8/48-#4814-26 SET #44-FOLDER #26



VOLTAGE AND RESISTANCE READINGS

Pin No.	12BE6 Volt.	12BE6 Res.	12AT6 Volt.	12AT6 Res.
1	-6VDC§	18KΩ	-.2VDC	10 Meg.
2	0V.	.7Ω	0V.	0Ω
3	24VAC	25Ω	0V,	0Ω
4	12VAC	13Ω	12VAC	13Ω
5	95VDC	90KΩ	-.5VDC	7.1 Meg.
6	95VDC	90KΩ	-.5VDC	2.1 Meg.
7	-.5VDC	7.1 Meg.	65VDC	310KΩ

Pin No.	50B5 Volt.	50B5 Res.	35w4 Volt.	35w4 Res.
1	-1.6VDC	370KΩ	0V.	INF.
2	0V.	0Ω	0V.	INF.
3	75VAC	70Ω	82VAC	110Ω
4	24VAC	25Ω	117VAC	140Ω
5	120VDC	90KΩ	117VAC	160Ω
6	95VDC	90KΩ	100VAC	130Ω
7	1.6VDC	370KΩ	130VDC	90KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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4814-26

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RCA
MODEL RP-177

TOP VIEW

RCA
MODEL RP-177

GENERAL INFORMATION

The record changer RP-177 is a two-post, drop-type mechanism designed to play automatically up to twelve 10-inch or ten 12-inch records, not intermixed. On completion of the last record, the pickup arm is automatically returned to a rest position on the stop switch button, shutting off the power to the drive motor.

A pickup muting switch is incorporated, which shorts out the pickup while the changer is in cycle. This prevents mechanical noise of moving parts from being amplified.

***Manufactured by* RADIO CORPORATION OF AMERICA**
RCA Victor Division, Camden, New Jersey

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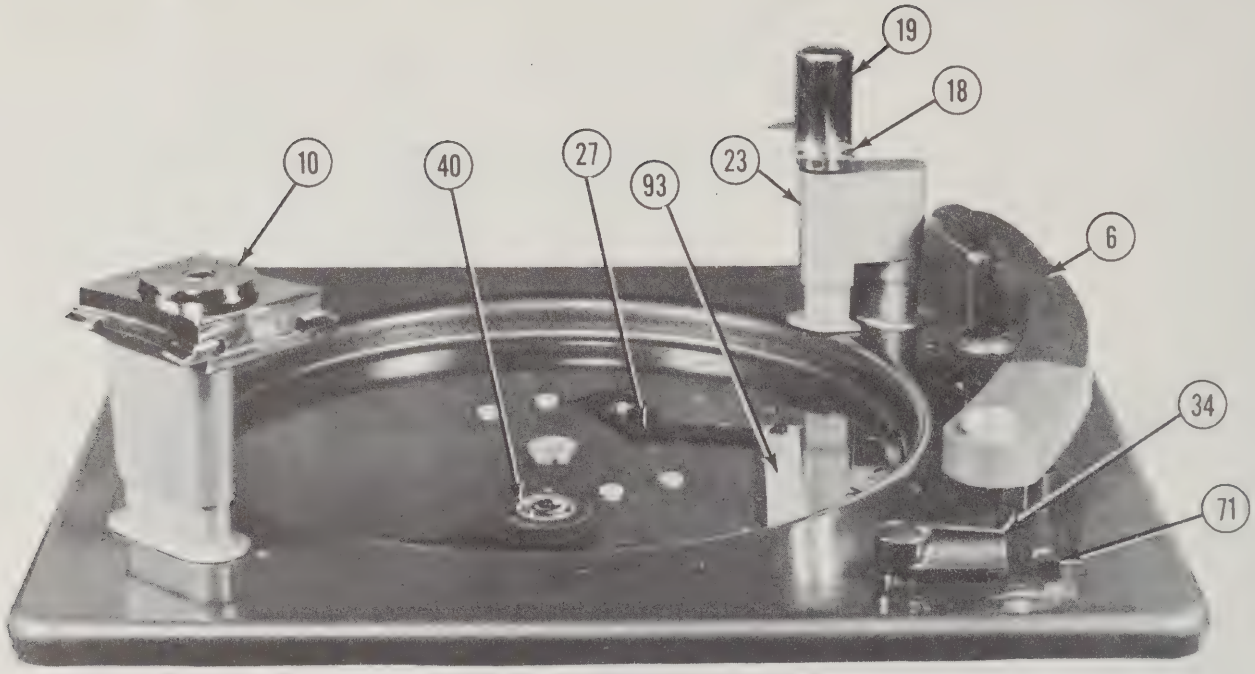
DATE 8/48-#4814-27 SET #44-FOLDER #27



TOP VIEW—LESS TURNTABLE AND SPINDLE ASSEMBLY

MANUAL OPERATION

1. Make certain the mechanism is out of cycle with the pickup arm on the rest.

2. Push the "Reject" knob (34) to the "Manual" position.

3. Turn the record support shelf (15) to the 12-inch position. This is done by turning the shelf in a clockwise direction. The separator swivel (23), which is mechanically linked to the support shaft (15), is also moved away from the spindle.

4. Lift up on the record separator knife (19) and turn it away from the spindle. This allows free movement for placing records on the turntable.

5. Place a record on the turntable and push the switch (71) to the "On" position.

6. Place the pickup arm on the record.

7. When the record has finished playing, return the pickup arm to its rest position.

AUTOMATIC OPERATION

1. Turn the record support shelf (15) to position it for 10-inch or 12-inch record. To change from 10-inch to 12-inch, rotate the support shelf in a clockwise position; from 12-inch to 10-inch, rotate the support shelf counter-clockwise.

2. Place a stack of records up to twelve 10-inch or ten 12-inch, not intermixed, on the record support.

3. Push the switch (71) to the "On" position.

4. Push the "Reject" lever (34) to the "Reject" position and release. The changer will now play the entire stack of records. On completion of the last record the changer will return the pickup arm to its rest position, and the power will be removed from the motor.

5. A record may be rejected at any time while being played by pushing the reject knob to "Reject" and releasing.

6. Lift and turn the separator shelf to remove records from the turntable.

CHANGE CYCLE

The change cycle may be started by the oscillation of the pickup arm in the eccentric groove of the records, or by any backward movement of the pickup arm as it comes to within 3 inches of the center of the record.

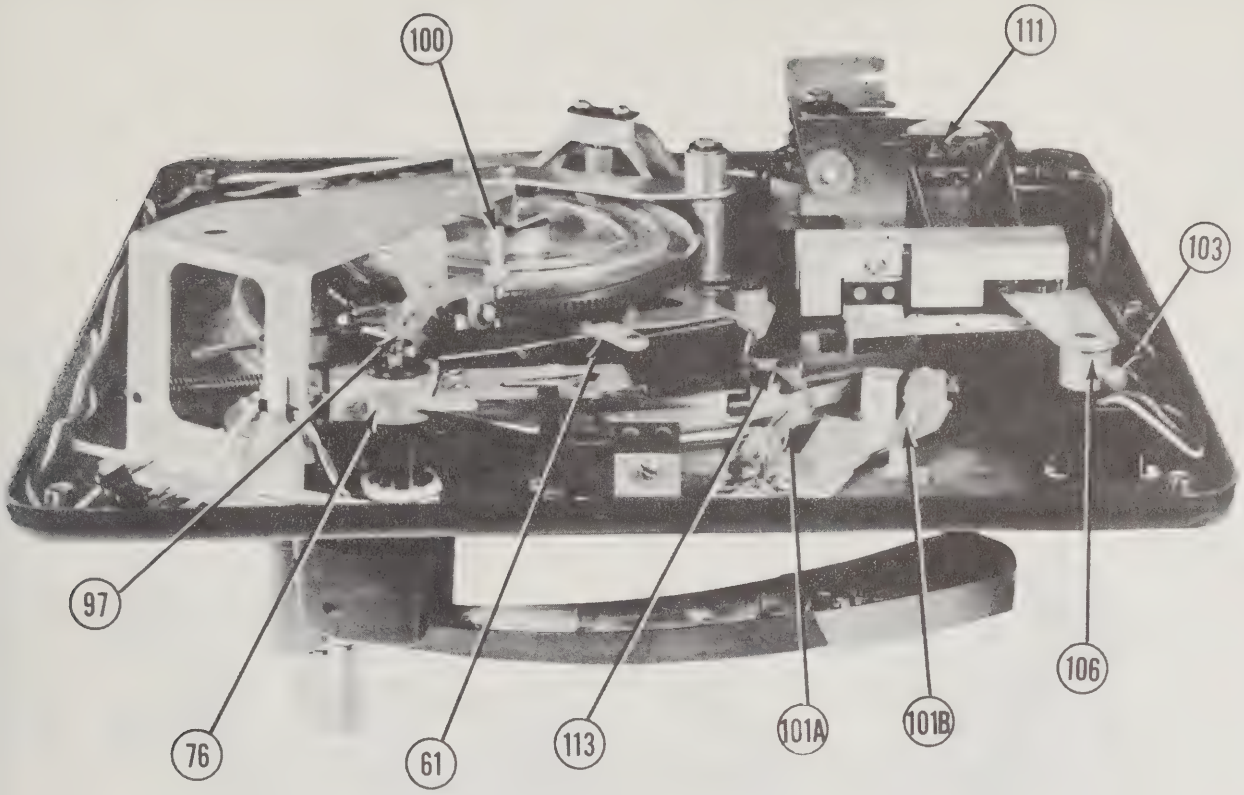
This action causes the trip pawl (78) to straighten and to push against the ratchet lever (61), thereby pivoting the ratchet lever from in front of the drive cam pawl (51A) and releasing this pawl. The drive cam pawl now engages the ratchet wheel (46), causing the drive shaft cam (51) to turn with the ratchet wheel; therefore, the motion from the turntable is transferred to the main gear (88).

As the main cam turns, an extrusion (61A) on the ratchet lever (61) rides out of the detent and around the hub of the main cam. This prevents the ratchet lever from blocking the drive cam pawl throughout the change cycle.

The adjusting screw (100) of the pickup arm elevating lever (97) now rides up the inclined portion on the outer edge on the bottom of the main cam, causing the pickup arm to raise from the record by means of the pusher rod (20).

The stud (81B) on the pickup arm lever (81), following the cam on the top surface of the main cam, directs the movement of the lever. As the cam rotates, the pickup arm lever (81) is pivoted away from the muting switch actuating lever (113), thus allowing the muting switch (101A) to be closed. The pickup arm lever now moves against the stud of the trip lever (76), swinging the pickup arm out clear of the records.

The stud of the separator lever (91), following the cam track on the bottom of the main gear, actuates the lever (91). This causes the separator shelf and shaft (18) to rotate,



BOTTOM—SIDE VIEW

selecting and dropping a record to the turntable. The bottom cam now reverses the rotation of the separator shaft, returning it to its original position.

The cam surfaces on top of the main cam now moves the pickup arm lever (81) away from the stud of the trip lever (76) and the pickup arm return lever (66) to move in against the stud of the trip lever (76). This moves the pickup arm in for set down. As the pickup arm lever (81) moves away from the stud of the trip lever (76), the retard lever (81A), hinged on the arm lever, stabilizes the pickup arm for accurate landing.

The index finger of the pickup return lever (66) moves against the separator shaft (77) to position the pickup arm for 10-inch or 12-inch position.

The adjusting screw (100) of the pickup arm elevating lever (97) rides down the incline of the main cam (bottom surface), thus lowering the pickup arm on the record.

The pickup arm lever (81) is now pivoted away from the stud of the trip lever (76), giving the pickup arm free movement across the record. The pickup arm lever is also moved against the actuating lever (113), causing the muting switch to open.

The extrusion (61A) of the ratchet lever (61) moves into the detent of the hub of the main gear. This causes the ratchet lever to be pivoted in the path of the drive cam pawl (51A), disengaging it from the ratchet wheel (46), removing the power from the drive cam (51) and main gear(88). Stud (81C) of the pickup arm lever (81) now moves into the step of the drive shaft cam (51) to maintain disengagement.

When the last record has been dropped to the turntable, the absence of the weight of a record on the separator shelf and shaft (18) allows the separator shelf and shaft (18) and the separator bottom shaft and shut-off cam (77) to be raised by the compression spring (80). Therefore, as the changer goes into cycle on completion of the last record, the finger of the return lever (66) engages the face of the shut-off cam (77A). This prevents the return lever (66) from pushing the pickup arm in for landing. The pickup arm is now lowered to a rest position on the stop switch button (35). The weight of the pickup arm on the switch button opens the switch (101B), thus removing the power from the motor.

ADJUSTMENTS

Pickup Arm Height Adjustment

The height adjustment may be made by turning the adjusting screw (100). Turning the screw clockwise raises the pickup arm. At maximum height during the change cycle, the distance between the sapphire and the turntable should be $1\frac{3}{16}$ inches.

Record Shelf Timing

With the record supports in the 10-inch position, place a 10-inch record on the supports. Loosen the set screw (94) and turn the record separator shaft until the edge of the record separating knife (19) is $\frac{3}{32}$" away from the edge of the record. Be sure the teeth of the separating knife are resting in the bottom of their slots at the time the adjustment is made. Tighten the set screw (94 zinc plated), and run the changer through its cycle several times to check correctness of adjustment; then tighten the copper plated set screw.

It may be necessary to vary this adjustment slightly if a 12-inch record does not drop properly.

Positioning of the Pickup Arm Set Down

With the changer in 10-inch position, place a 10-inch record on the turntable and rotate the changer through the cycle, by hand, until the sapphire is just ready to land on the record. Check the index finger of the pickup arm return lever (66) to see if it is against the record separator shaft

A PHOTOFACT "EXPLODED" VIEW

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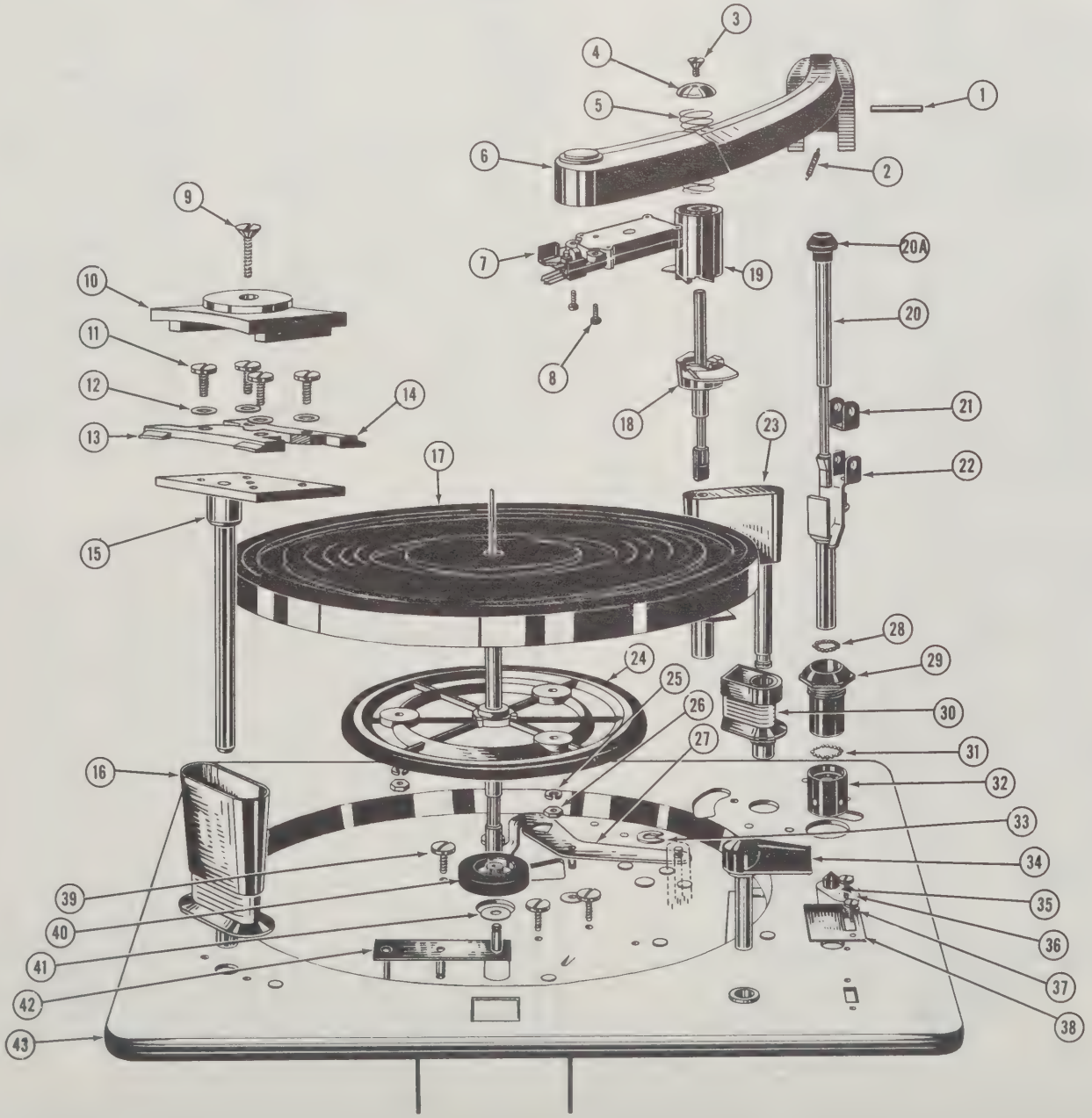

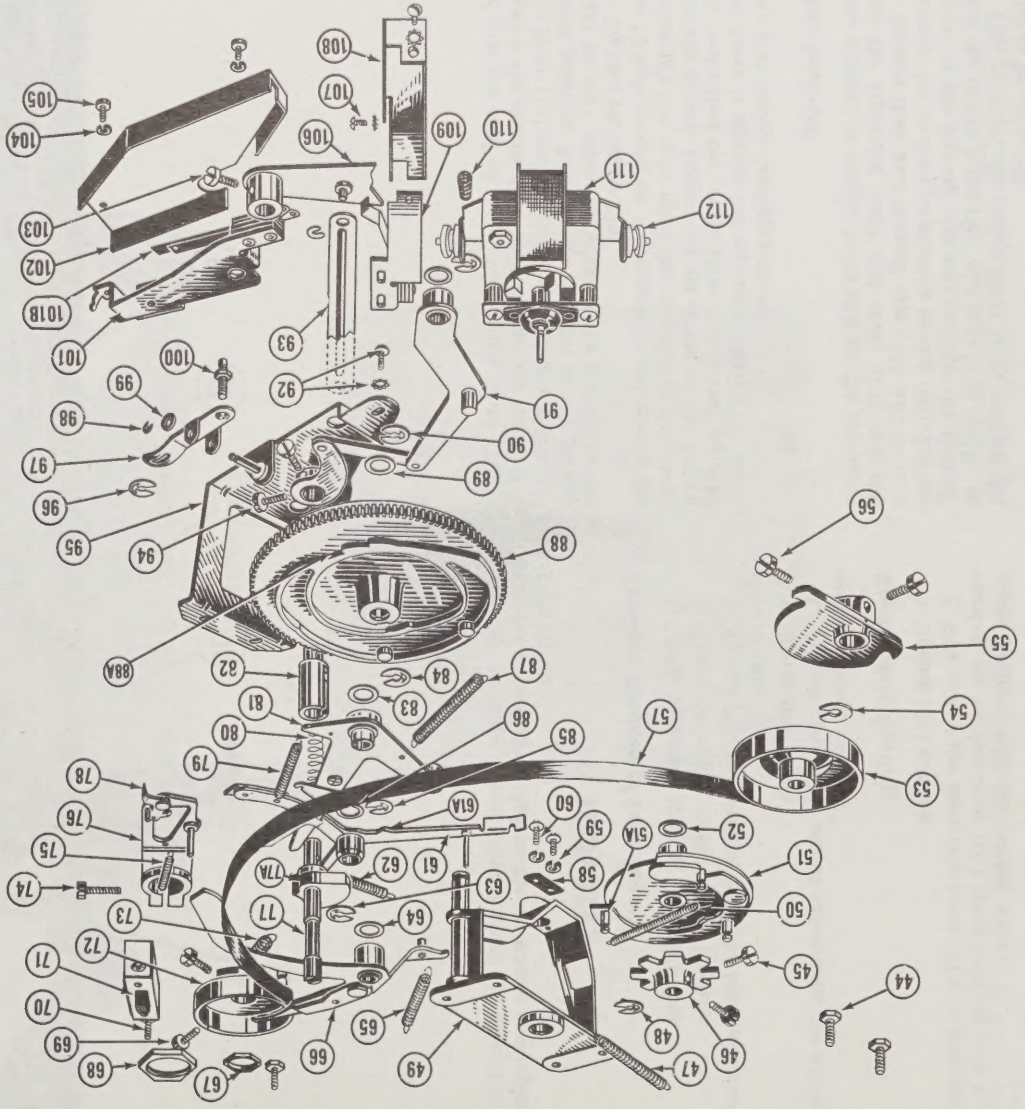
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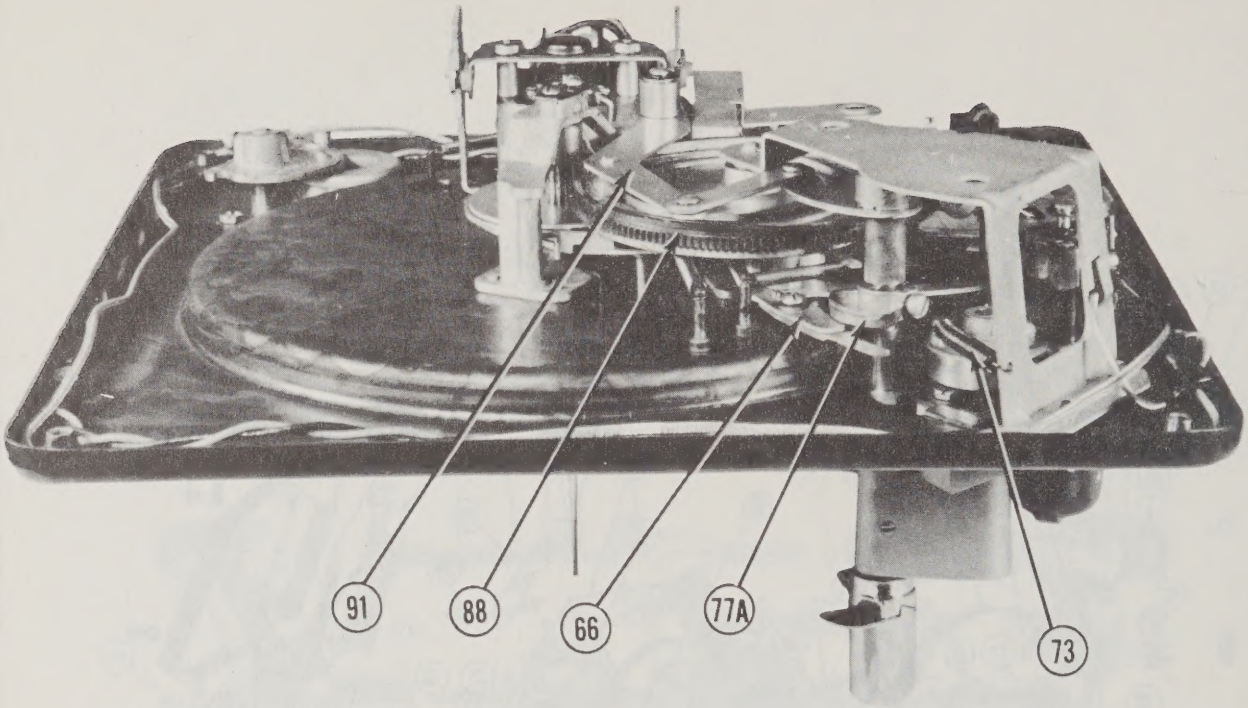


BOTTOM—REAR VIEW

(77), and that the stud of the pickup return lever (76) is firmly against the return lever (66). Loosen the screw (74) of the trip lever (76) and move the pickup arm to the correct landing position. The correct position of the pickup arm should be $4\frac{11}{16}$" from the edge of the spindle to the sapphire. Tighten the screw (74).

Place a 12-inch record on the turntable and rotate the changer through the cycle until the sapphire is just ready to land on the record. Loosen the set screw on the return lever (66), and adjust the return lever so that the finger of the return lever is against the separator shaft (77) when the pickup is in correct landing position.

Automatic Shut-Off

With the absence of weight of records on the separator shelf (18), the separator shelf and shaft (18) and the separator bottom shaft and shut-off cam (77) will be in a raised position due to the compression spring (80). Loosen the set screw in the shut-off cam and position the shut-off cam so that the return lever (66) will strike the middle of the cam. This prevents the return lever from moving the pickup arm in for set down.

Check to see that the index finger of the return lever (66) rides in over the top of the cam when the record shelf is depressed by the weight of one record. Tighten the set screw.

Spacing Between Record Posts

Turn the record support shelf and shaft (15) to the 10-inch position. Loosen the set screws (69) in the separator drum (72). Hold the separator swivel and shaft (23) against the end of its slot in the motorboard, and turn the drum (72) to take up any slack in the belt (57). Tighten the set screws. Remove the record support cap (10). Loosen the set screws (11) and adjust the record support shelves (13 and 14), so that both 10 and 12-inch records set half way up the slope when support posts are turned to their respective positions. Tighten the set screws and replace the support cap.

TROUBLES

Repeats Playing of Last Record

1. Check separator shaft (77) for binding.
2. Check the upper shaft (18) for binding.
3. Spring (80) too weak to raise the separator shaft and shut-off cam (77).
4. Spring (80) binds.
5. Shut-off cam (77A) out of adjustment. See adjustment on "Automatic Shut-off."

Continuous Cycling

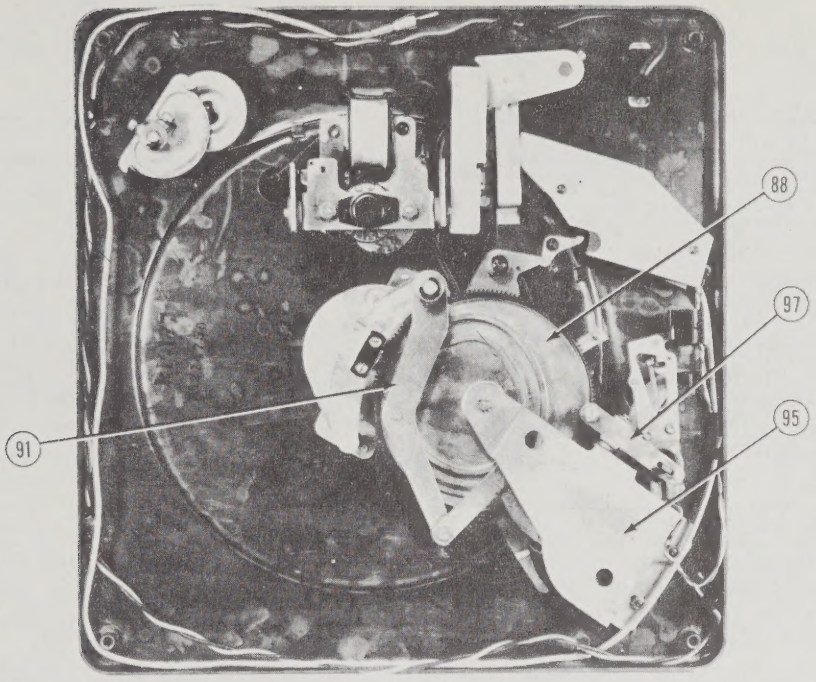
1. Spring (62) missing.
2. The end of the drive cam pawl (51A) is rounded, preventing the ratchet lever (61) from holding it in a disengaged position with the ratchet wheel.

Fails to Trip

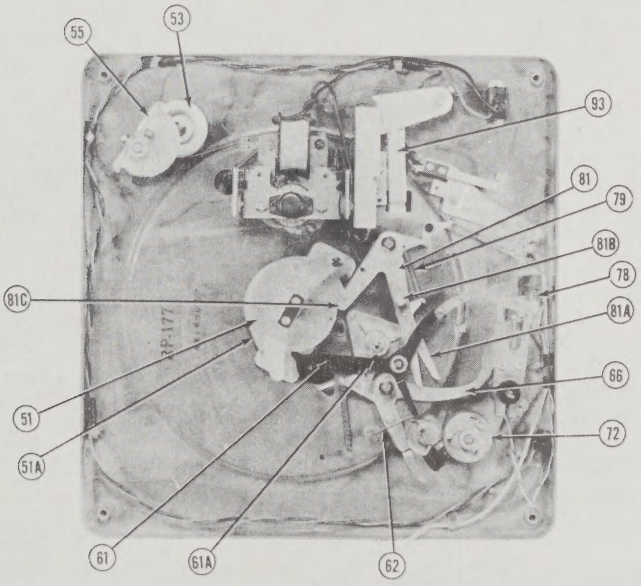
1. The trip pawl spring (75) missing.
2. Drive cam pawl (51A) binds on the drive cam (51).
3. The trip pawl (78) too blunt.
4. Spring (62) too strong.

Trips Early

1. Spring (62) too weak.
2. Spring (75) too strong.
3. Trip pawl (78) binds.
4. The end of the drive cam pawl (51A) rounded; will not stay engaged with the ratchet lever.



BOTTOM VIEW



BOTTOM VIEW—LESS CAM

Incorrect Landing

1. See adjustment on "Positioning of the pickup arm set down."

Pickup Arm Continues to Come Down in Rest Position

1. The shut-off cam (77A) improperly set. See adjustment on "Automatic Shut-off."
2. Spring (65) missing.
3. Shafts (18 and 77) binding; will not move down with the weight of records on the record shelf.

LUBRICATION

Light machine oil (SAE No. 10) should be used to oil the bearings of the motor.

Use Sta-Put No. 320, or its equivalent, on all bearing surfaces, except motor bearings.

Use Sta-Put No. 512, or its equivalent, on other surfaces.

Do not allow grease or oil to come in contact with the drive motor spindle, the rubber tire on the friction drive disc (24), or the idler wheel (40). If grease, or oil, or any foreign material gets on any of these surfaces, it should be removed immediately with carbon tetrachloride or naphtha.

Do not oil or grease the record support shaft (15).

MECHANISM TIMING

With the ratchet lever (61) and the pawl (51A) on the drive shaft cam (51) in playing position, as shown in the picture of the "Bottom View—Less Cam," remove the support brace (95) and the link and lever assembly (91) shown in the picture of the "Bottom View." Remove the "C" washer on the main cam shaft and slip the main cam (88) down far enough so that it can be rotated with respect to the drive gear (51). Rotate the main cam until the stud (81B) of the pickup arm lever (81) will be in a rest position in the detent (88A) of the main gear shown in the "Exploded View." Put the main cam back in mesh with the drive gear and replace the "C" washer. Replace the separator link and lever assembly (91) and support brace (95) as shown in the picture of the "Bottom View."

PARTS LIST

Ref. No.	Part No.	DESCRIPTION
1	70905	Pivot Pin
2	71099	Pivot arm spring (.187″ O.D. x ¾″—24 turns)
3	72414	6-32 x ¼ oval head screw
4	72415	Record separator cap
5	70895	Record separator spring—upper (.622″ O.D. x 1 11/16—13½ turns)
6	72397	Pickup arm
7	72551	Crystal cartridge complete
7A	38452	Needle guard
7B	70341	Mounting nut and washer for sapphire
7C	72345	Sapphire and holder assembly
7D	37763	2-56 x ⅛″ needle guard screw
8	70912	4-40 x ⅜ binder head mounting screws for crystal
9	72587	10-32 x ¾″ oval head screw for record support cap
10	72423	Record support cap
11	70861	10-32 x ⅜″ record support screw binder head
12		Flat washer—approx. 7/16″ O.D., 3/16″ I.D., .030″ Thick
13	72418	Record support for 12-inch records
14	72417	Record support for 10-inch records
15	72419	Record support shelf and shaft
16	72590	Record support base
17	72421	Turntable including rubber mat
	70866	Rubber mat only for turntable
18	72413	Record separator shelf and shaft
19	72416	Record separator knife
20	70909	Pusher rod including rubber cushion
20A	38607	Rubber cushion
21	71098	"U" clamp to lock pivot arm in position
22	70906	Pivot arm and shaft
23	72399	Record separator swivel and shaft
24	73054	Turntable spindle drive disc less tire
	37873	Rubber drive tire (drive disc)
25		Lockwasher No. 6
26		Hex nut 6-32
27	72403	Automatic-manual-reject operating lever
28	3658	Steel balls (3/32″ dia.)
29	72585	Upper pivot arm bushing
30	72589	Record separator support
31	3658	Steel balls (3/32″ dia.)
32	70911	Lower pivot arm bushing
33	20165	"C" washer
34	72586	Reject lever
35	71102	Pickup stop switch button
36	72820	Pickup arm rest
37	72588	4-40 x 5/16″ binder head screw (on-off switch)
38	72591	Index escutcheon
39	72409	8-32 x ¼″ turntable spindle support screw
40	36274	Idler wheel
41	39996	Fiber washer for idler wheel
42	70863	Motor idler wheel
43		Base plate
44		10 x ⅜″ self-tapping screw
45	38626	8-32 x ¼″ fillister head set screw
46	38624	Ratchet wheel
47	71546	Idler arm tension spring (.187″ O.D. x ⅞″—31 turns)
48	33726	"C" washer for idler arm
49	70891	Turntable spindle support bearing
50	70854	Drive shaft cam and pawl spring (.195″ O.D. x 1 3/16″—42 turns)
51	70853	Drive shaft cam and pawl
52	70879	Washer for cam and pawl
53	70899	Record support drum
54	2917	"C" washer
55	70845	Record support shaft cam
56	39772	10-32 x 5″16″ fillister head set screw
57	70900	Record separator to support belt
58	70880	Spring thrust plate for turntable

Ref. No.	Part No.	DESCRIPTION
59		No. 6 lockwasher
60	70883	6-32 x 5/16″ round head screw
61	70853	Ratchet lever
62	71549	Ratchet lever spring
63	2917	"C" washer
64	70884	Bearing washer
65	71726	Pickup arm return spring (.218″ O.D. x 1½″—48½ turns)
66	70847	Pickup arm return lever
66A	72401	Return lever adjusting screw
67	70890	9/16″-32 hex nut for separator support
68	70886	¾″-32 hex nut for pickup arm pivot bearing
69	32869	10-32 x 5/16″ screw, flat end (record separator drum)
	72562	10-32 x 5/16″ set screw (record separator drum)
70		Self-tapping screw No. 10—⅜″ long
71	72407	On-off switch
	71106	On-off switch cover
72	70898	Record separator drum
73	71544	Drum and belt tension spring (.255″ O.D. x 1⅜″—27½ turns)
74	72402	10-32 x ⅝″ trip lever screw
75	71543	Trip lever spring (.135″ O.D. x 21/32″—58 turns)
76	70856	Trip lever less spring
77	71280	Record separator bottom shaft
77A	70848	Shut-off or segment cam
	72405	10-32 x ¼″ cam screw
78		Trip lever pawl (part of 76)
79		Pickup arm lever fringe spring
80	70850	Record separator shaft bottom spring (.290″ O.D. x 1.35″—14¾ turns)
81	70858	Pickup arm lever
82	70849	Record separator shaft and bushing
83	70877	.280″ I.D. x 7/16″ flat washer
84	2917	"C" washer
85	20165	"C" washer
86		½″ O.D. x .193″ I.D. x .020″ thick—steel washer
87	71547	Pickup arm lever tension spring (.218″ O.D. x 1½″—48½ turns)
88	70864	Main cam
89	70877	.280″ I.D. x 7/16″ flat washer—main cam
90	2917	"C" washer
91	70852	Record separator shaft link and lever
92		No. 6 lockwasher 6-32 x 5/16″ screw
93	72406	"Automatic-manual-reject" link lever
94	71100	10-32 x 5/16″ round head screw—zinc plated
	31118	10-32 x 5/16″ fillister head screw—copper plated
95	72420	Support brace
96	2917	"C" washer
97	38631	Pickup arm elevating lever
98	20165	"C" washer
99		7 1/16″ O.D., 3/16″ I.D., 1/32″ Thick—flat washer
100	39691	10-32 x ⅞″ fillister head adjusting screw for pickup Arm lift lever
101	70876	Stop and muting switch
102	70855	Stop switch cover
103	70883	6-32 x 5/16″ round head screw
104		No. 4 lockwasher
105		4-40 x 3/16″ round head screw
106	72404	"Automatic-manual-reject" detent lever
107		4-40 x ⅛″ round head machine screw
108	72411	Manual shorting switch cover
109	72410	Manual shorting switch
110	71545	Motor tension spring (.192″ O.D. x 1½″—58 turns)
111	38612	Motor 105-125 volts—60 cycle
112	34368	Rubber grommet
113		Muting switch actuating lever (part of base plate)